Advant® OCS
with Master software

GCOM™ Interface
AdvaSoft™ for Windows

User’s Guide

ABB

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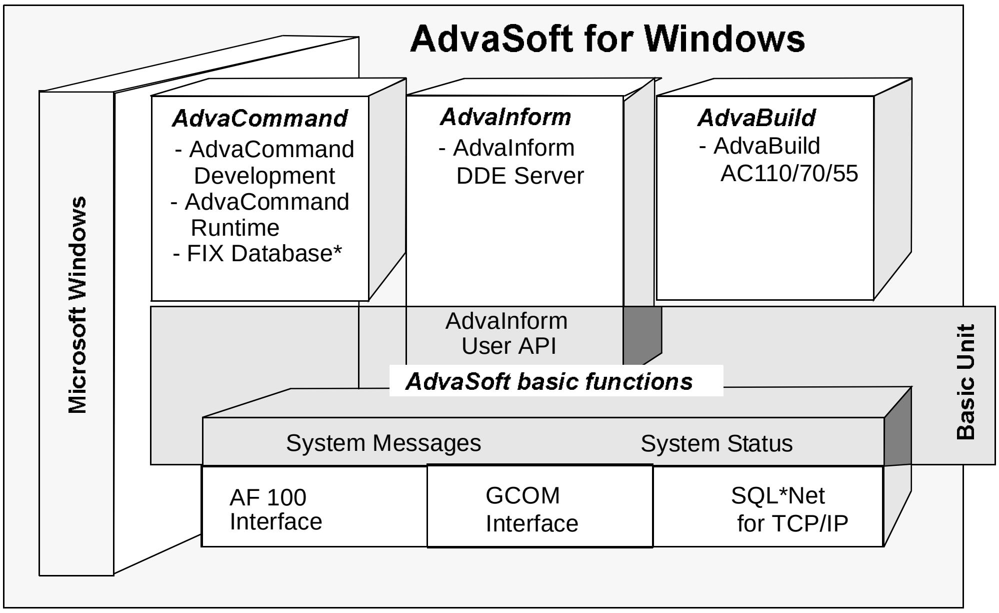
Chapter 1 Introduction

1.1 General Information

GCOM (**G**ateway **COM**munication protocol) is a high-performance (10 Mbit), serial synchronous protocol, intended to work in Local Area Network (LAN) configurations, such as Ethernet, over medium communication distances. GCOM is implemented as a data link user, operating on a standard IEEE 802.3 bus. The bus has no specific master station which means that all stations have equal access to it.

This guide provides you with information about the **GCOM Interface**, a communication option for the AdvaSoft for Windows program suite.

The GCOM Interface makes it possible for the AdvaSoft for Windows user to supervise, monitor, and access process data for objects residing in process stations connected to the network.



* Both versions of AdvaCommand, Development and Runtime, are available with the FIX Database option

Figure 1-1. The logical structure of AdvaSoft for Windows

You can connect the following stations to a network using GCOM:

- MasterGate 230/1
- MasterPiece 200/1
- Advant Controller 450
- SuperView 900 station

You can also communicate with controllers/process stations not directly connected to the GCOM network. By using a MasterGate 230/1 as a transit node between a GCOM and a MasterBus 300 network, an AdvaSoft station with GCOM Interface can access data in controllers/process stations connected to the MasterBus 300 network (Figure 1-2).

The GCOM Interface is intended to work in MS-Windows 3.1 or 3.11 (Windows for workgroups) and takes full advantage of the user interface functionality that follows with this environment. GCOM Interface uses common communication hardware, so you do not need any special GCOM Interface hardware.

The GCOM Interface is based on a DOS device driver with a NDIS2 interface. The NDIS2 interface provides the ability to use any IEEE 802.3 compliant network card with NDIS2 support, alone or in parallel with other network protocols.

The figure below shows an example of a GCOM configuration in an Advant OCS system.

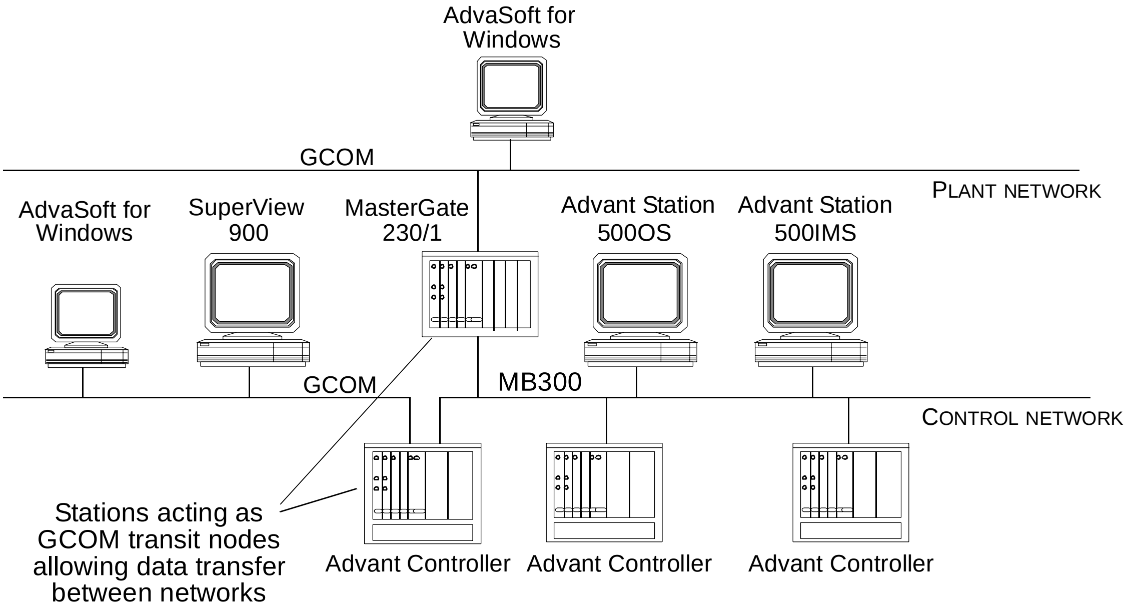


Figure 1-2. AdvaSoft participation in the Advant OCS system

Basic Knowledge Requirements

For the run-time operation of the GCOM Interface, you need general knowledge about MS-Windows and Advant OCS. You should also be able to work with a client application, used by AdvaSoft for Windows, for example, a DDE application using the DDE Server application or the View application integrated in AdvaCommand for Windows.

To learn about your AdvaSoft for Windows system, we recommend you to participate in the training courses provided by ABB Industrial Systems training centres.

1.2 Equipment Requirements

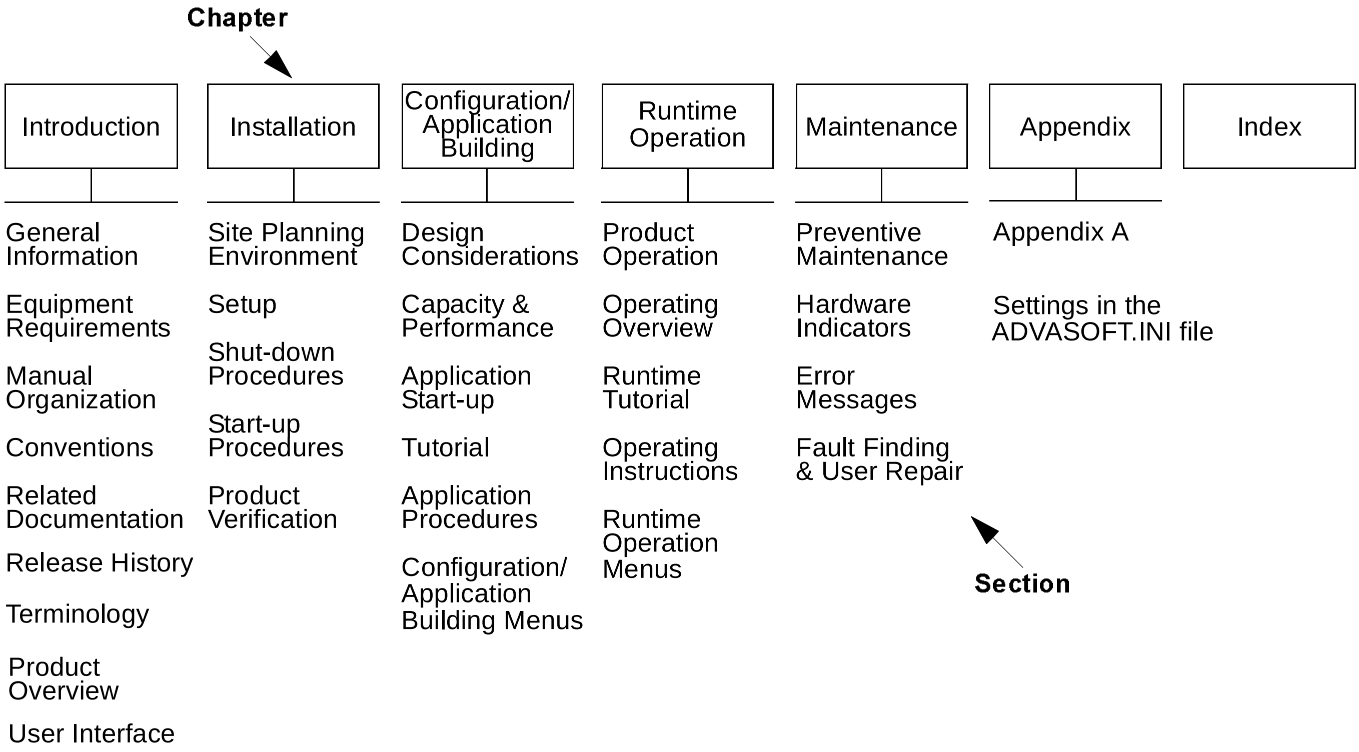
Basic equipment requirements for the GCOM Interface implementation:

- Hardware
  - A PC with 80486/DX2 66 MHz or higher CPU
  - One 1.44 Mbyte 3.5” diskette drive
  - A hard disk with at least 2 Mbyte of available disk space for the GCOM Interface option. For a installation of the AdvaSoft Basic software package, we recommend 70 Mbyte.
  - 16 Mbyte of RAM memory
  - One free ISA bus slot for the IEEE 802.3 communication board
  - One IEEE 802.3 compliant communication board.
- Operating system
  - MS-DOS 5.0 or later
  - MS-Windows 3.1 or 3.11.
- Application software
  - AdvaSoft Basic Unit
    one or more of the following:
  - AdvaCommand for Windows
  - AdvaInform for Windows DDE server
  - User applications using the AdvaInform User API.

Additional hardware requirements, depending on the application software, are explained in the Equipment Requirements section of the *AdvaSoft for Windows User's Guide*.

1.3 Manual Organization

The figure below is an overview of this guide's structure. All documentation, related to the AdvaSoft concept, follow the same structure.



1.3.1 The Contents of the Chapters

Chapter 1 Introduction
GCOM Interface functions, hardware and software requirements, related documentation, terminology, manual organization and the its part in the AdvaSoft for Windows system.

Chapter 2 Installation
How to install and configure GCOM Interface on a PC. Environment requirements are listed.

Chapter 3 Configuration and Application building
How to configure GCOM Interface after the installation.

Chapter 4 Run-time operation
Operation during start-up, runtime, and shutdown. Details about GCOM Interface in the MS-Windows environment. Descriptions of all dialogs and menus

Chapter 5 Maintenance
Maintenance of software and hardware, backup routines, preventive precautions, GCOM Interface error handling, and actions to be taken when an error occurs.

Appendix A
Reference material, GCOM Interface dedicated statements in the ADVASOFT.INI file.

1.4 Conventions

The following conventions are used throughout this guide:

Item	**Convention**
…AdvaSoft for Windows User's guide…	Document names are in *italics*
…personal computer (PC)…	Names abbreviated are written in full the first time they are presented, followed by the abbreviation.
…press the **Insert** key… (…press <**Insert**>…) …press the **enter** key… …press <**enter**> …	If you are to press single keys, the keys labeled on the keyboard begin with an uppercase letter and are written in **Boldface**. Keys not labeled on the keyboard are in **boldface** in lowercase letters.
…press <**Alt, F4**>…	If you are to press and release more than one key, key names are separated by a comma (,)
... press <**Ctrl-C**>....	If you are to press more than one key at a time, the key names are separated by a dash (-).
…press the **CANCEL** button…	Screen buttons appear in **BOLDFACE**, all uppercase letters.
…the **File** menu…	You are instructed to choose menus and menu items. Names of menus and menu items appear in **Boldface** and start with an uppercase letter.
Program source text	Program source text is written in `Courier` font.
…you enter **MYIMS**…	Characters you are to type appear in **boldface**.
…click the **OK** button…	"Click" or "Double-click" means pointing with the mouse cursor, then clicking the left button.
Highlighting part of a text or spreadsheet	Select is used, for example, when you are instructed to select cells in a spreadsheet.
Performing operations in a sequence	When you are asked to perform sequences of operations, they are numbered in chronological order.

1.5 Related Documentation

Below is an overview of required, optional and related documentation available from ABB depending on your system configuration, followed by a short description of each guide.

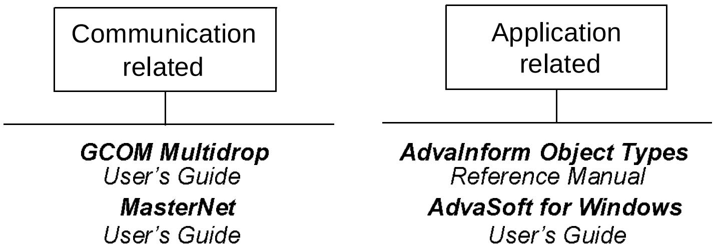


Figure 1-3. GCOM related documentation

There are several AdvaSoft for Windows manuals covering different software options and system configurations.

The *AdvaInform Objects Types Reference Manual* provides information about table names and attribute names for all objects types supported by Advant Station 500 series IMS.

AdvaSoft for Windows User's Guide provides information for installation of the various AdvaSoft options, including GCOM Interface, and for application building, operation and maintenance of the functions included in the basic unit.

1.6 Release History

The version number indicates a major release with new functionality, whereas the revision number indicates updates, including minor changes or fault rectification.

Table 1-1. AdvaSoft for Windows Product Release History

Unit	Version/ Revision	Description
GCOM Interface	1.0	Including required software for configuration, communication and signal handling. Version 1.0 provides support for the following objects and functions: -Basic object handling -Event and Alarm distribution object (EADISTR) -System status -Time Synchronization
GCOM Interface	1.1	Extended with support for the TTD object

1.7 Terminology

1.7.1 Used Acronyms

AC	Advant Controller.
AS	Advant Station.
DAT	An object type in the Advant OCS databases that is able to store different types of single-value application data. Also used in DCS data packets.
DCS	Distributed Control System, a process station with a distributed database, for example AC 410. This is a common term for such systems.
DDE	Dynamic Data Exchange. This is a form of interprocess communication that uses shared memory to exchange data between applications in the MS-Windows environment (as in the DDE-server).
DSX	Distributed Signal eXhange.
EADISTR	Event and Alarm Distribution (object).
ES	Engineering Station. The common term for stations with the functionality for programming and configuration controllers in the ABB automation system, for example, AS 500 ES
GCOM	Gateway COMmunication protocol.
IMS	Information Management Station.
MMI	Man Machine Interface. A common term for operator interactive functionality.
MP 200/1	MasterPiece 200/1.
NDIS	Network Driver Interface Specification. An option for the IEEE 802.3 interface.
OAS	Object Access Service, a part of the AdvaInform User API.
OCS	Open Control System.
OS	Operator Station.
PDU	Protocol Data Unit.
TCP/IP	Transmission Control Protocol/Internet Protocol. A standard communication protocol.
TTD	Time Tagged historical Data

1.7.2 Definition of Terms

Advant OCS	Advant Open Control Systems.
Client application	An application that subscribes to objects from the automation system. For example, an application that subscribes to objects via the DDE Server is a DDE client.
Cyclic	When a task is executed or a value is updated within certain intervals it is cyclic. An example is the cyclic update of an analog input with a cycle time of 1 s.
Demand (request for data)	When a task is executed or a value is updated on demand from another task, for example, when an analog input is updated on demand, it is updated in the requesting node when it asks for data.
Event	When a value or object is updated causing that a status change occurs, it is event-updated. For a definition of object, see below. An event is defined by two parameters. *Reason* and *attribute*. The Reason tells *what* has happened to the object and Attribute tells *which attribute* (value, some of the limits for example) that has actually changed. There are two types of event, Subscription on Event and Time Tagged events.
GCOM Driver	The intermediate software between the GCOM Interface and the network card
Clock Master	The node responsible for sending a global time synchronization signal
Clock Slave	A node that synchronize it's time to that of the clock master
MasterNet 300/300E	The name of the ABB Master Computer Network Communication System.
MasterGate (MG 230/1)	Gateway station that supports communication between separate control networks.
MasterPiece (MP 200/1)	This is a process station in the Advant OCS.
Node	A node is a network unit, with its own address, communicating on a network. A node can be an AdvaSoft for Windows, a gateway or an Advant Controller. Sometimes also referred to as station.
Node number	Each node in the network is given its own unique node number.

Object (Process)	Object (Process) is a physical or calculated process object, or a functional unit or type circuit containing all related inputs and outputs. An example of a process object is an analog input including value, limits, status, etc.
Process event	A process event occurs when status for an object is, in some way, changed.
Subscription	A subscription is requesting data from an automation system.
System	System means part or all of an automation system, usually appearing here in the context "…units included in your system," where "system" means AdvaSoft for Windows with options.
Topic	A topic is a variable used to specify the name of a communication protocol in the DDE Server used by client applications to specify subscriptions.
Transit Node	A node giving access to nodes connected to other networks such as MB300.
Unit	A unit pertains to a software or hardware task or part which runs independently or as part of a larger unit. The basic unit and Advant Fieldbus 100 are units.
User Interface	The user interface is the dialog between the user and a computer program, as in MS Windows user interface, with program groups, icons, menus and menu items.

1.8 Product Overview

The GCOM Interface consists of

- GCOM Communication software
- GCOM DOS Device Driver.

The GCOM Communication software, described in Figure 1-4, enables data exchange between MS-Windows applications and process stations connected to the GCOM network or process stations reachable through transit nodes.

No hardware is included in the GCOM Interface. A special network driver, GCOM DOS Device Driver, enables communication functionality with a IEEE 802.3 compatible network card.

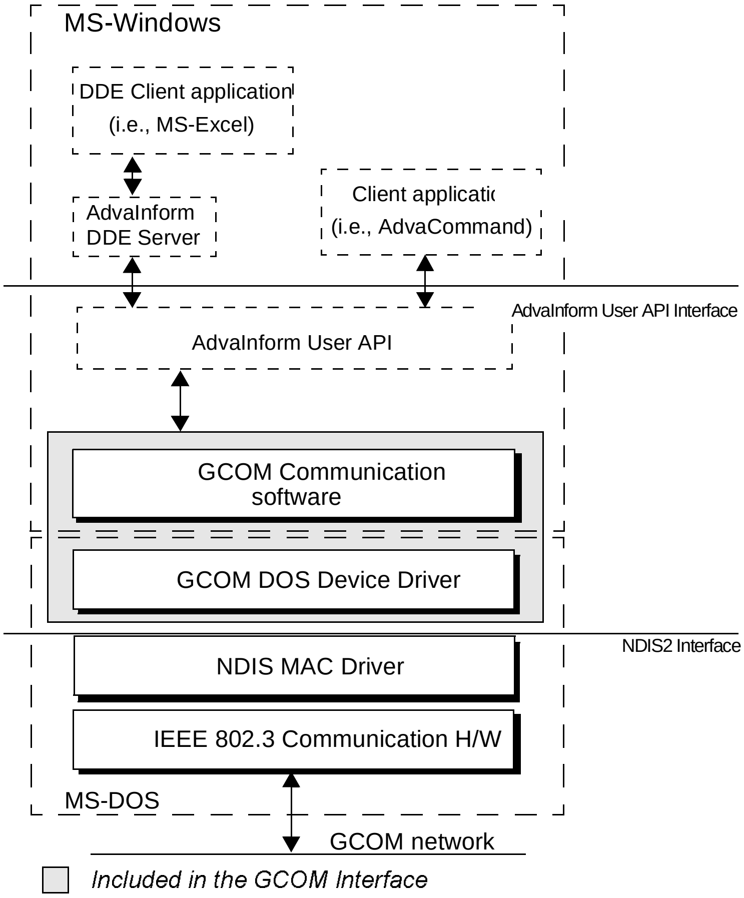


Figure 1-4. GCOM in the AdvaSoft for Windows product suite

You only have to install the GCOM Interface in the nodes that have a process data interchange over the GCOM network.

1.8.1 Supported Object Handling and Network Functions

GCOM Interface supports the following object handling and network functions:

- **Symbolic name translation** for objects that belong to connected nodes
  The resolved operation allows GCOM to use object references (consisting of node, network and database address) instead of the symbolic object name, thus is the time for the acquiring object data reduced.
- **Data subscription**
  You can subscribe for process data from MasterPiece 200/1, Advant Controller 450 and other process stations types connected to the GCOM network. You can also subscribe for process data from nodes, via the routing functionality in GCOM together with the usage of a MasterGate 230/1, from the MasterBus 300 network.
- **Sending orders**
  You can send orders via GCOM to change status and/or values for objects (AI, AO, DI, DO and DAT) connected to the GCOM network.
- **TTD log**
  GCOM provides access to the Time Tagged historical Data logs, residing in the controllers, by use of the Log Manager Object.
- **System status**
  Provides status for all available nodes reachable from the GCOM Interface. The function works for both nodes directly connected to the GCOM network and nodes connected through GCOM transit nodes.
- **Time synchronization**
  Provides the GCOM network with the possibility to use a global network time synchronization. An AdvaSoft for Windows station can be configured as Master, Slave or None.
- **Mapping of process events**
  Allows client applications to subscribe to for "Time Tagged" process events.
- **Communication status monitoring**
  When a network change occurs, node connection is lost, for example, a message will be sent to the client application. A message will also be sent when the connection is re-established.
- **Functions for configuring network, nodes** and other communication related functions.

Some of these functions are explained in detail in the following sections. See also chapters three and four for information about GCOM Interface configuration and run time operation.

1.8.1.1 Symbolic Name Translation Operation

When an application uses a symbolic name to access an object instance, the symbolic name translation function allows the GCOM Interface to transform the symbolic object name into information about object location and object type. This is done automatically without any operator action involved.

A name translation process is initiated when your application, using an AdvaInform User API function, tries to retrieve object information for an object. If the object is not already resolved (resident in memory or in the local symbol file, GCOMSYMB.DTA) a name translation message is broadcasted over the network. When a station responds with the object information (network, node, logical file, record and object type), the information is stored in the memory and written to the local symbol file, GCOMSYMB.DTA. This information is then used in subsequent accessing of the object and reduces the access time, see Figure 1-5.

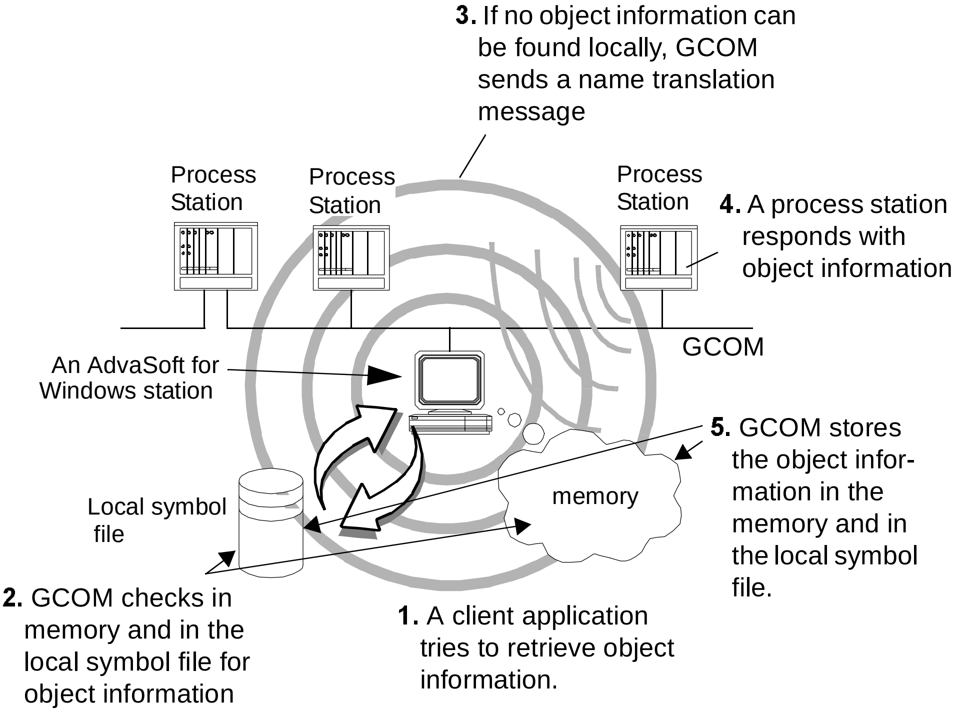

3. If no object information can be found locally, GCOM sends a name translation message
Process Station
Process Station
Process Station
4. A process station responds with object information
GCOM
An AdvaSoft for Windows station
5. GCOM stores the object information in the memory and in the local symbol file.
memory
Local symbol file
2. GCOM checks in memory and in the local symbol file for object information
1. A client application tries to retrieve object information.

Figure 1-5. A resolve operation

It is possible to manually initiate a resolve operation by selecting **Resolve** in the **Option** menu in AdvaSoft's main window or in the **System** menu presented when clicking the GCOM icon.

A manually initiated resolve operation starts with copying the GCOMSYMB.DTA file to GCOMSYMB.OLD followed by deleting the original symbol file. A name translation request is then broadcasted to every connected node in the network. A new symbol file is created using the information gathered from the name translation request.

A reason for manually initiate a resolve operation is when the local symbol file has to be updated to reflect changes made in the process stations' databases.

NOTE

A manually initiated resolve operation might take some time because an attempt is made to resolve all objects present in the AdvaSoft stations internal cross-reference database.

1.8.1.2 Data Subscription

The data subscription function collects one or several specified attributes from one or several specified database references (objects). The following object types are supported with all attributes by the GCOM Interface.

- **AI**
- **AO**
- **DI**
- **DO**
- **DAT**

You can make a single- or multi-attribute subscription for all attributes.

Subscribed data is returned to your application depending on the type of the subscription request, demand, on event or cyclic. Cycle time shorter then 30 sec are mapped to the standard cycle times of 1, 3 respectively 9 sec. Cycle times longer than 30 sec are created through cyclic demand subscription.

The following additional objects are also supported:

- **System Status**

  only the communication part is supported by the System Status object. The function provides support for all available nodes reached from the GCOM Interface. Both nodes directly connected to the same GCOM network and nodes reached through GCOM transit nodes.

- **LogManager**

  The TTD logs, resident in Master Piece 200/1 and Advant Controller 450 controllers, are subscribed through the Log Manager object.

- **EADISTR**

  Supports event subscription of Time Tagged process events.

Table 1-2. Supported AdvaInform User API Client functions versus object type

User API Client function (bci or win)	AI, AO, DI, DO, DAT	Log Manager	EADISTR	System Status
GetAttributes	X			X
GetAttribWithInit				
GetAttribOnEvent	X		X	
GetAttribOnEventWithInit		X		
GetAttribCyclic	X			X
GetAttribCyclicWithInit				

1.8.1.3 Commands

You can send commands via GCOM Interface to change object status or value for objects connected to the GCOM network. The following commands are supported for each object type.

Table 1-3. Supported operations versus object types

Operation / Object Type	**AI**	**AO**	**DI**	**DO**	**DAT**
Select/Deselect	X	X	X	X	
Block/Deblock Print	X	X	X	X	
Block/Deblock Alarm	X	X	X	X	
Block/Deblock input	X		X		
Block/Deblock output		X		X	
Man/Auto		X		X	
Change value	X	X	X	X	X
Change alarm limit	X				
Acknowledge alarm	X		X		

GCOM Interface converts the request to the Advant OCS DSX order signal format and sends the order to the controller.

If a communication failure occurs, a error message will be sent to the System Messages application.

1.8.1.4 Hardware Configuration and Diagnostics Software

No configuration or diagnostic functions for the hardware handling are included in the GCOM Interface. See your hardware documentation for information about your communication hardware.

1.8.2 Networks - Overview

1.8.2.1 The OSI model

The International Organization for Standardization (ISO) model, established for describing the flow of data between the physical connection to the network and the end-user application, is the most commonly used model for describing networking environments. The Open Systems Interconnect (OSI) model is a seven-layer structure that outlines the communications of data from hardware (the physical layer) to the user interface (application layer). Each OSI layer provides a service for the layer immediately above it.

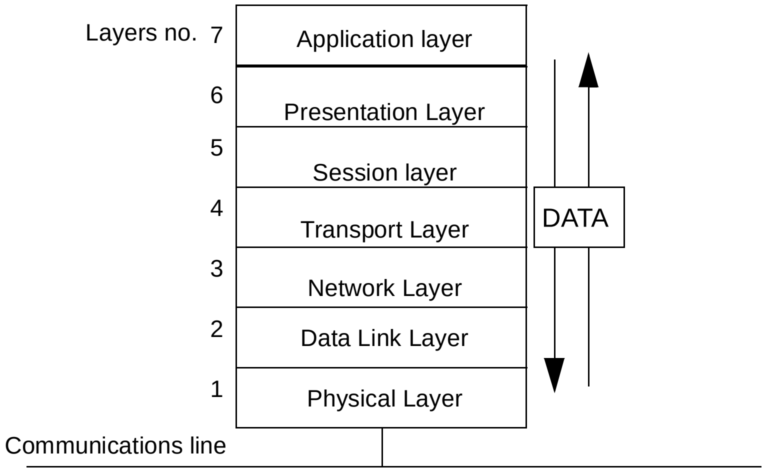
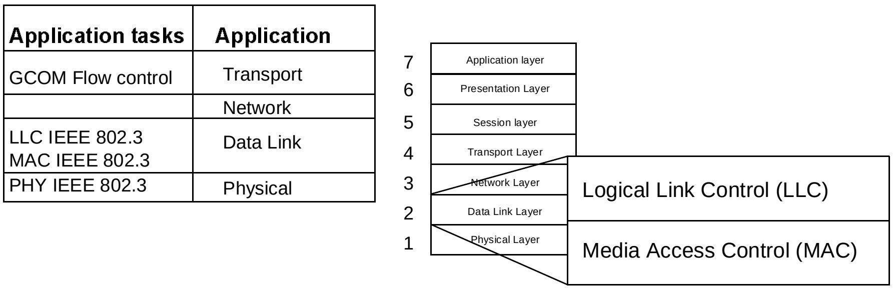


Figure 1-6. The OSI model

1.8.2.2 The IEEE 802 model

As a proliferation of local area network (LAN) products emerged, and with them a need for consistency, the Institute for Electrical and Electronic Engineers (IEEE) began to define LAN standards. Its project was called 802, for the year and month it began (February 1980).

LAN standards were defined for the Physical and Data Link Layers of the OSI model. Both models were developed at almost the same time and shared information which resulted in two compatible models. In the standard 802, the Data Link Layer was divided into two sublayers: the Media Access layer (MAC) and the Logical Link Control (LLC).



Application tasks	**Application**
GCOM Flow control	Transport
	Network
LLC IEEE 802.3 MAC IEEE 802.3	Data Link
PHY IEEE 802.3	Physical

Figure 1-7. The IEEE 802 addition to the OSI model and the GCOM protocol implementation.

In the figure above, there is a “null” network layer and a minimal transport layer in the GCOM protocol implementation.

1.8.2.3 The Network Device Interface Specification (NDIS)

The standard, known as the Network Device Interface Specification (NDIS), defines the software interface - called NDIS interface - used by network transport protocols to communicate with the network adapter card.

A process called binding is used to establish the initial communication channel between the transport protocol driver and the MAC driver. A software called Protocol Manager, defined by NDIS, is used to bind the MAC transport protocol drivers. These turnips protocol drivers resides in the layer above the MAC driver layer.

The NDIS version 2.0.1, used by Windows for Workgroups, allows a single computer to have four network adapter cards installed (only one is allowed in the case of GCOM). Each network adapter card can support up to four protocols, with up to eight transport protocols supported on a single computer

1.8.2.4 Windows for Workgroups Network Drivers

The following Windows for Workgroups network components are of interest when installing the GCOM Interface:

- Protocol Manager (PROTMAN.DOS)
- NDIS compatible network adapter card (MAC) driver

The Protocol Manager (PROTMAN.DOS) is used to bind the network protocols to an NDIS-compliant network adapter card (MAC) driver. PROTMAN.DOS is a real-time MS-DOS device driver and specified in the CONFIG.SYS file before all the other network device drivers. The Protocol Manager is loaded during the MS-DOS start up and administrates the binding between the network transport protocols and the NDIS-compliant network adapter card driver. For this, Protocol Manager uses the information in the PROTOCOL.INI file. In the case of GCOM Interface, the network adapter card driver is named GCOMDRV.SYS.

Before you start Windows for Workgroups, you have to enter the **net start** command in the AUTOEXEC.BAT file, in order to start the network software and bind the real-mode network drivers specified in the CONFIG.SYS file.

1.9 User Interface

The GCOM communication software uses a standard MS-Windows user interface.

The GCOM communication software is represented by the following icon in the AdvaSoft program group in the Program Manager.

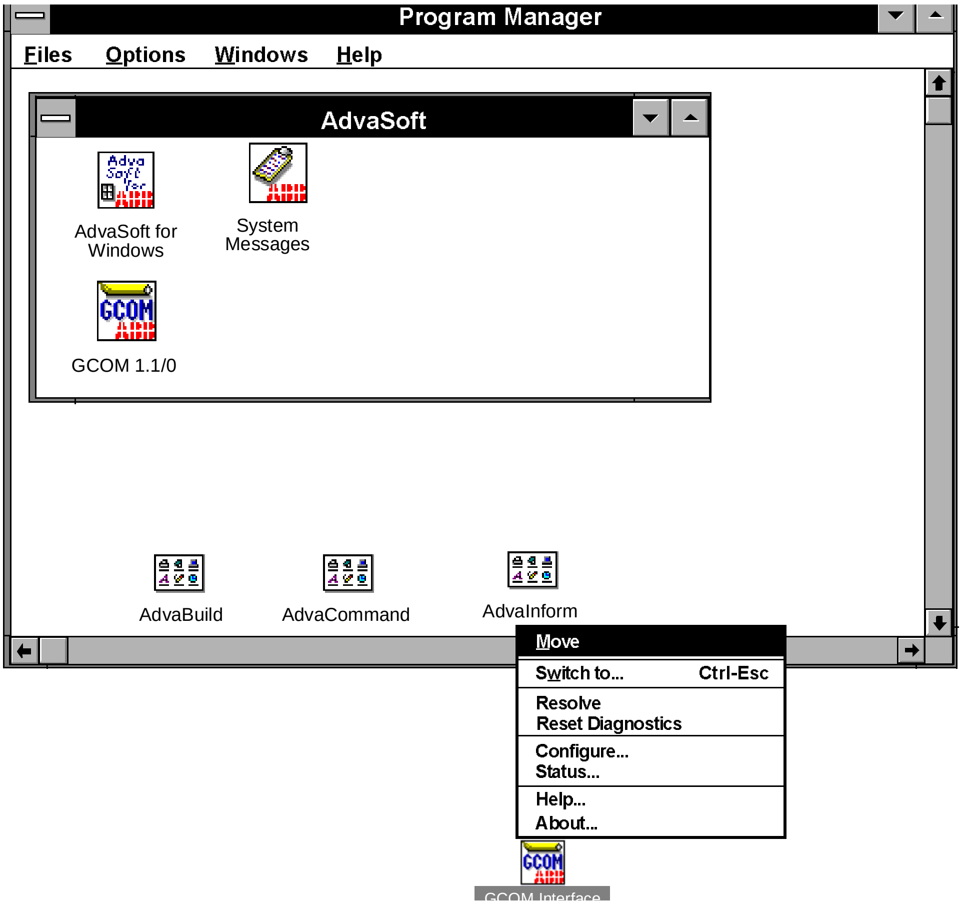


Figure 1-8. GCOM communication software User Interface

Chapter 2 Installation

2.1 Site Planning Environment

Before you start installing the GCOM Interface, make sure that:

- the IEEE 802.3 communication board and the corresponding hardware handling software are installed and configured (see the related product documentation). AdvaSoft for Windows installation software uses the name and type of your network interface card to determine the appropriate driver to use and bindings to perform.
- the environmental conditions (humidity, temperature and chemical) stated for your workstation are fulfilled. For information about environmental conditions, concerning your PC, refer to the PC documentation.

NOTE

The person installing the GCOM Interface software should be familiar with the network communication software, besides GCOM Interface, used on the AdvaSoft for Windows station.

We recommend you to use Microsoft TCP/IP, or other TCP/IP compatible, communication software to avoid compatibility problems during installation and run-time.

2.1.1 Setup

This chapter describes how to install the GCOM Interface. The following topics are covered:

- Software installation
- Necessary information during installation:
  - GCOM node number
  - GCOM network number
  - GCOM transit node number
  - Control Network Number
- Additional information concerning installation in different Window versions environments

  GCOM Interface has two installation configurations, one for Microsoft Windows 3.1 and one for Microsoft Windows for Workgroups 3.11. It is important to be familiar with the differences since each MS-Windows version has it own way to handle communication. The GCOM Interface installation software detects your Windows version and, based on that information, uses the appropriate installation method.
- Description of installed files

2.2 Installing

Use the AdvaSoft for Windows installation program when installing the GCOM Interface. For a description on how to start and use the AdvaSoft for Windows installation program, refer to the *AdvaSoft for Windows User’s Guide, chapter 2.* You need the following two diskettes during the installation procedure:

- Advasoft for Windows Installation
- GCOM Interface for AdvaSoft for Windows, Version 1.1/0.

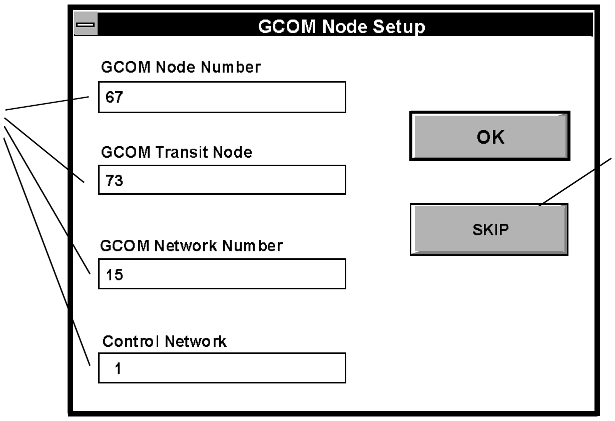
2.2.1 Installation start

The GCOM Interface installation description starts in the AdvaSoft’s installation window.

1. In the AdvaSoft for Windows installation window, check the GCOM option and accept by clicking the Continue button.
2. The installation program prompt you for disks labelled GCOM Interface for AdvaSoft for Windows, Version 1.1/0.

   Insert the disk when prompted and click OK. AdvaSoft’s installation program copies the various files on the diskette and places them in the GCOM directory located as a subdirectory to the ..\ADVASOFT directory.
3. The installation program prompt you for network setup information

The installation program presents a dialog where you enter information about your network setup, see Figure 2-1.



GCOM Node Number: 67

GCOM Transit Node: 73

GCOM Network Number: 15

Control Network: 1

The installation programs extracts the network information from the ADVASOFT.INI file and places it as default in the dialog fields.

Use the SKIP button if you want to leave this installation step and enter the information later.

Figure 2-1. The GCOM Node setup dialog

The installation program scans your system for a ADVASOFT.INI file that belongs to a existing AdvaSoft for Windows installation. If a ADVASOFT.INI file exists, the installation program extracts the network setup information and uses it as default in the dialog box fields.

The scanning procedure starts with the Windows directory. If the ADVASOFT.INI file is not found in the Windows directory, the program scans all directories present in the PATH statement located in the AUTOEXEC.BAT files.

In case of no detected ADVASOFT.INI file, the dialog box fields are left empty and you have to provide the information manually.

NOTE

If you skip this installation step, you have to enter the information after the installation. You have two possibilities:

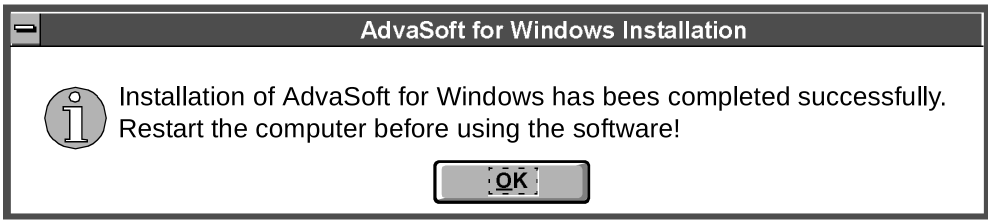
- If no configuration is done during the GCOM Interface installation, the GCOM SETTINGS dialog is presented automatically the first time the GCOM Interface is started.
- Manually edit the ADVASOFT.INI file in a text editor and add the GCOM specific network setup entries.

We recommend the first method because the risk for missing an entry is minimized. For more information about the specific GCOM entries in the ADVASOFT.INI file, refer to *Appendix A, Settings in the ADVASOFT.INI file*.

The installation will proceed with the installation procedure. The installation program will make the necessary changes to the system files and install the GCOM Interface specific software.

4. End of installation procedure

   The AdvaSoft for Windows Installer presents the following message at the end of the installation procedure, see Figure 2-2.



Installation of AdvaSoft for Windows has bees completed successfully.
Restart the computer before using the software!

Figure 2-2. The message that marks the end of the installation procedure

5. Edit the system files, see Section 2.5.1, Verifying Changes to System Files. You have to make the stated changes in order to have a working GCOM Interface application. For examples on the actual appearance of the system files, see Section 3.1.3, System Files Configuration.
6. Restart your computer

   To make all the changes in the various system files active you have to close Windows and restart your computer. Remember to remove the installation diskettes first. The changes in the CONFIG.SYS, AUTOEXEC.BAT, SYSTEM.INI and PROTOCOL.INI file is read during start up and your environment is configured in accordance with them.

2.2.2 Installed Files and Created Directories

During installation, the installation program creates a new subdirectory to the AdvaSoft directory, called GCOM. In this directory, the installation program places the following GCOM Interface related files:

- GCOM.DLL
- GCOM.HLP
- GCOMDRV.SYS
- GCOMEXE.EXE
- SIGNAL.EXE

When a resolve operation is done for the first time, the local symbol file, GCOMSYMB.DTA is placed in the GCOM\DATA directory. When a manually initiated resolve operation is performed, the existing GCOMSYMB.DTA is copied to GCOMSYMB.BAK and a new, updated, GCOMSYMB.DTA is created.

2.3 Shut-down Procedures

The GCOM Interface is normally closed in connection with the closing of AdvaSoft for Windows.

Emergency shutdown

If your client program stops responding to the system, and by that locks the computer and makes it impossible to shut down the GCOM Interface, you have three choices:

- Try to close your client program by pressing <**Ctrl-Alt-Delete**>. Windows checks for programs no longer responding and terminates them.
- If the step above does not work, try exit, and then restart Windows.
- If non of the steps above are successful, restart by pressing Ctrl-Alt-Delete. (in MS-Windows you have to press this key sequence twice). If this does not help either, turn off your computer for some seconds and then turn it on

2.4 Start-up Procedures

The GCOM Interface is automatically started as a part of the AdvaSoft for Windows start up. When running, the GCOM icon is shown on the Windows desk. Alternatively you can start the GCOM Interface by double-clicking the program icon from the Microsoft Windows program manager. This can be of interest when you want to check network connections and when configuring the GCOM Interface.

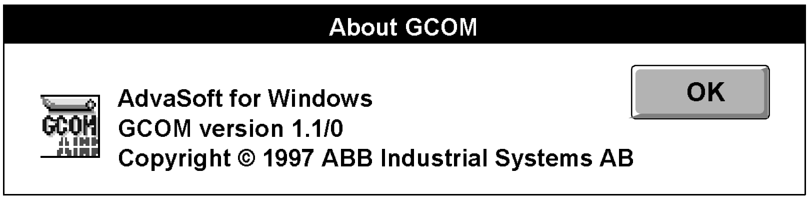
NOTE

Before running the GCOM Interface, you have to specify the node number, network number and transit node number. If you do not do this during installation, you can add this information in the GCOM Settings dialog, presented the first time the GCOM Interface is started.

2.5 Product Verification

To verify that the installation was successful, and that connection with the GCOM network is established, do the following:

1. Check for any error messages during the computer start-up procedure after the installation. We recommend you, if your AdvaSoft for Windows station is using MS DOS version 6.0 or later, to manually confirm every start-up command in the CONFIG.SYS and the AUTOEXEC.BAT file during the start-up procedure. Especially look for error messages when the Protocol Manager (PROTMAN.DOS), the NDIS and the GCOM drivers are loaded. Also look for error messages when the Window network functions is loaded (Net start or Net bind).
2. Check that the GCOM icon is created in the AdvaSoft program group, see Figure 1-8.
3. Open the GCOM system menu (by double clicking, if not AdvaSoft is started, on the GCOM icon in the AdvaSoft program group and then click on the displayed GCOM icon on Window's desk top) and choose the **About...** item to verify the program version.



AdvaSoft for Windows
GCOM version 1.1/0
Copyright © 1997 ABB Industrial Systems AB

Figure 2-3. The About GCOM dialog

4. Choose Status item in GCOM system menu to check for network connectivity. You can also check the **GCOM Communication status** dialog box, presented when you click on the **Netw Status** button, to see which nodes are available.

Additional Verification Operations with AdvaInform for Windows Installed

5. Open a DDE session, for example in MS Excel. To do this, enter the following in a spreadsheet cell:

   =IMDDE|*protocol_cycle time*!*object name.object attribute*

For example

You want to access the Status attribute for a object named AIC73_8, using the cycle time of 3 sec. Enter the following in a MS Excel spreadsheet cell:

```
=IMDDE|GCOM_3!AIC73_8.VALUE
```

After you entered this, you have to perform a link update operation in MS Excel to make the entry active.

2.5.1 Verifying Changes to System Files

NOTE

The system files **must** be edited according to the following description **before** starting the GCOM Interface application.

During installation, the installation program updates some of the system files. Depending on MS Window version used on your system, the following system files are changed, see Table 2-1:

Table 2-1. Updated system files depending on Windows version

Files	Windows 3.1	Windows 3.11
CONFIG.SYS	YES	YES
AUTOEXEC.BAT	YES	YES
SYSTEM.INI	NO	YES
PROTOCOL.INI	YES	YES

For examples on how the various system files are modified, see Section 3.1.3, System Files Configuration.

Before you make any changes to the system files, the installation program copies the original system files and adds an ".ABB" extension to the file name. This ensures that you always have the original system files intact.

Additions to the system files are added at the end of each file. If you use a multiple configuration environment, introduced in MS DOS version 6.0, where you can have several different start alternatives in the DOS environment, the additions are placed at the end of the CONFIG.SYS and the AUTOEXEC.BAT files disregarding any configuration alternatives.

You have to manually edit these files and place the additions in appropriate places/sections or in the appropriate files, see also Section 3.1.3, System Files Configuration.

Chapter 3 Configuration/Application Building

3.1 Configuration Considerations

Besides configuration during the installation, GCOM Interface provides you with some additional configuration options, such as number of connected networks and additional transit nodes. These options also have to be configured for obtaining specified performance.

This chapter describes the initial configuration of the GCOM Interface and gives additional information regarding the installation program operations, differences regarding installation between Windows 3.1 and Windows 3.11 environments, performance and configuration utilities.

Before you start the configuration process, keep the following in mind:

- Do you have all the information you need for configuration GCOM Interface? You need information regarding network, node addresses and the objects connected to it. Is there a network layout with all nodes placed on their actual sites at hand?

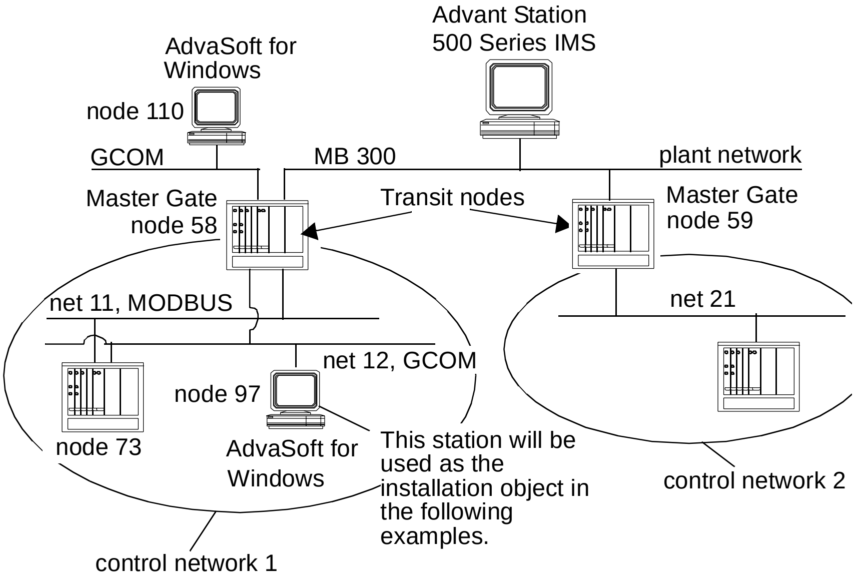


Figure 3-1. Example of a network layout. This layout is used in the examples in this section.

- Is the installed communication software configured and ready for use?

  To solve compatibilities problems that always arise when two different communication products are to work in a common environment, you should be familiar with the communication software used in the AdvaSoft station.

3.1.1 GCOM Address Convention

The network and node addresses follow the rules stated for the *ABB MasterNet.* They are specified by the parameters NETW and NODE, which are limited to:

- NETW=11-99 (control network connection) or 110-119 (plant network)
- GCOM Network Number = first digit decided from witch control network the GCOM network belongs to, second digit is 1-9.
- NODE=1-99

See the *ABB MasterNet* documentation for the rules when addressing nodes in the GCOM network. Required communication address parameters are described below along with examples of various network configurations.

3.1.2 Object Configuration

Due to the fact that GCOM Interface is intended for "high-end" controllers with an internal object handling functionality, no special object configuration functionality is included in the GCOM Interface software.

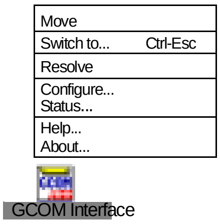
3.1.3 System Files Configuration

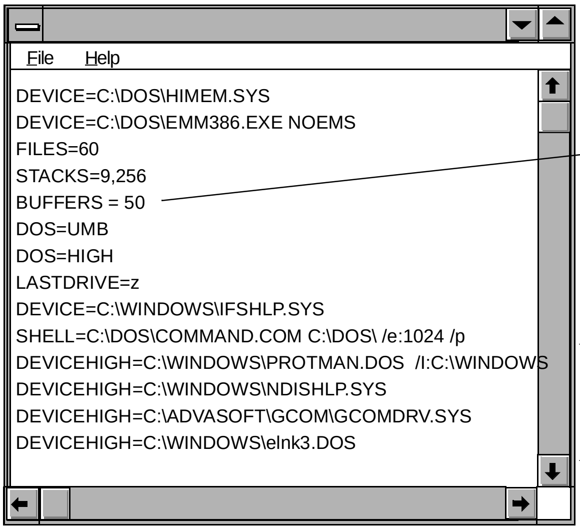
AdvaSoft for Windows installation program will change and add some statements in the system files as stated in *Chapter 2*. The following section will give you examples on how the different system files are affected and their appearance after a GCOM Interface installation.

CONFIG.SYS

Due to the fact that GCOM's network driver, GCOMSYS.DRV, is intended to work in the MS- DOS environment, all network related software have to be loaded during the MS-DOS start up. This is to provide the GCOM network driver with all necessary network information and network functionality.

The following statements is added to the CONFIG.SYS file, see Figure 3-2 (Win. 3.11) and (Win 3.1).



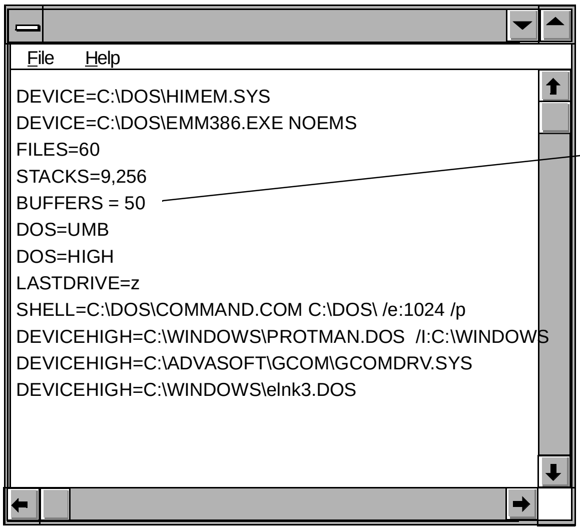


```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS
FILES=60
STACKS=9,256
BUFFERS = 50
DOS=UMB
DOS=HIGH
LASTDRIVE=z
DEVICE=C:\WINDOWS\IFSHLP.SYS
SHELL=C:\DOS\COMMAND.COM C:\DOS\ /e:1024 /p
DEVICEHIGH=C:\WINDOWS\PROTMAN.DOS  /I:C:\WINDOWS
DEVICEHIGH=C:\WINDOWS\NDISHLP.SYS
DEVICEHIGH=C:\ADVASOFT\GCOM\GCOMDRV.SYS
DEVICEHIGH=C:\WINDOWS\elnk3.DOS
```

The Buffers statements is set to 50.

These statements are added during the GCOM installation. The NDISHLP entry is moved from the SYSTEM.INI to the CONFIG.SYS file.

Figure 3-2. Example of a Win. 3.11 CONFIG.SYS file configured for using GCOM



```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS
FILES=60
STACKS=9,256
BUFFERS = 50
DOS=UMB
DOS=HIGH
LASTDRIVE=z
SHELL=C:\DOS\COMMAND.COM C:\DOS\ /e:1024 /p
DEVICEHIGH=C:\WINDOWS\PROTMAN.DOS  /I:C:\WINDOWS
DEVICEHIGH=C:\ADVASOFT\GCOM\GCOMDRV.SYS
DEVICEHIGH=C:\WINDOWS\elnk3.DOS
```

The Buffers statements is set to 50.

These statements are added during the GCOM installation.

Figure 3-3. Example of a Win. 3.1 CONFIG.SYS file configured for using GCOM

The Protocol Manager, PROTMAN.DOS, is used to bind the network protocols to an NDIS-compliant network adapter card (MAC) driver. The PROTMAN.DOS statement has to be specified before the other network drivers in the CONFIG.SYS file. The Protocol Manager examines the information in the PROTOCOL.INI file and uses the information to bind the network transport protocols, also identified in the PROTOCOL.INI file, to the specified NDIS-compliant network card.

NOTE

> If the PROTMAN.DOS does not precede the other driver files, the driver file will display an error message stating that the Protocol Manager was not found during system initialization.

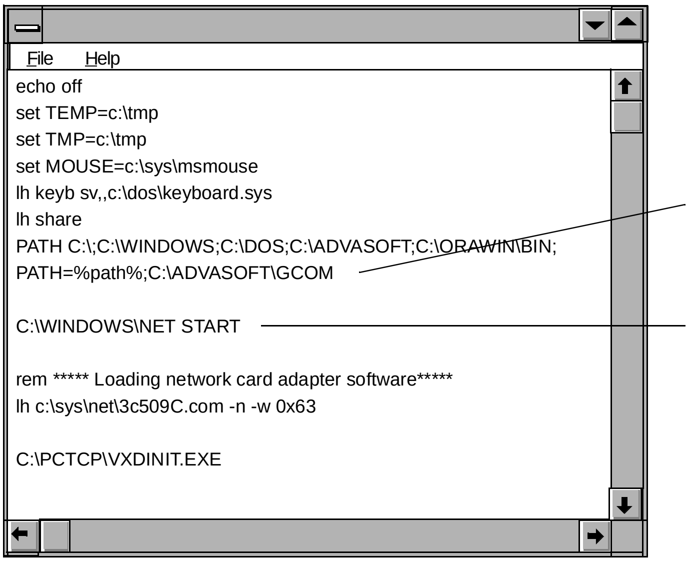
The NDIS network card driver, NDISHLP.SYS, is used to define how the network protocols will communicate with the network card.

The statement GCOMDRV.SYS invokes GCOM's network driver.

In this example, a 3Com Etherlink III network card was used and the related driver was invoked by the last statement, ELNK3.DOS.

The AUTOEXEC.BAT file

The following changes are made to the AUTOEXEC.BAT file when installing GCOM Interface in a MS Windows for Workgroups environment (Windows 3.11), see Figure 3-4.



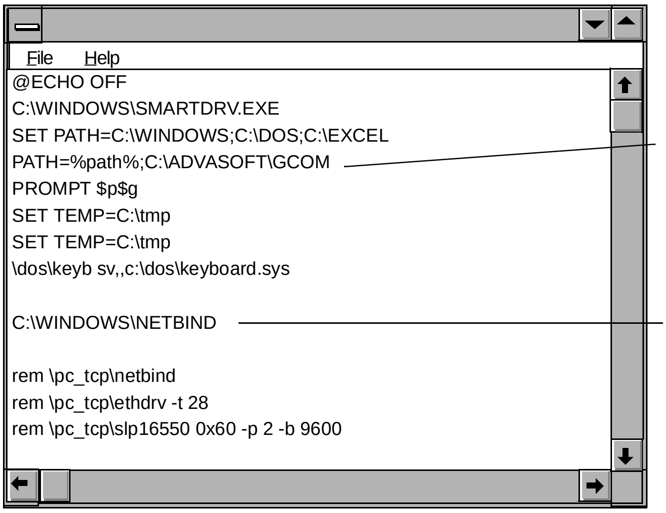
```
echo off
set TEMP=c:\tmp
set TMP=c:\tmp
set MOUSE=c:\sys\msmouse
lh keyb sv,,c:\dos\keyboard.sys
lh share
PATH C:\;C:\WINDOWS;C:\DOS;C:\ADVASOFT;C:\ORAWIN\BIN;
PATH=%path%;C:\ADVASOFT\GCOM

C:\WINDOWS\NET START

rem ***** Loading network card adapter software*****
lh c:\sys\net\3c509C.com -n -w 0x63

C:\PCTCP\VXDINIT.EXE
```

The installation program adds a PATH statement with the path to the GCOM directory.

This statement is added during the installation procedure invoking the Windows for Workgroups network functionality

Figure 3-4. Example of an Windows 3.11 version of the AUTOEXEC.BAT file configured for use of GCOM Interface

In a Windows 3.1 environment, the following statements are added, see Figure 3-5. .



```
@ECHO OFF
C:\WINDOWS\SMARTDRV.EXE
SET PATH=C:\WINDOWS;C:\DOS;C:\EXCEL
PATH=%path%;C:\ADVASOFT\GCOM
PROMPT $p$g
SET TEMP=C:\tmp
SET TEMP=C:\tmp
\dos\keyb sv,,c:\dos\keyboard.sys

C:\WINDOWS\NETBIND

rem \pc_tcp\netbind
rem \pc_tcp\ethdrv -t 28
rem \pc_tcp\slp16550 0x60 -p 2 -b 9600
```

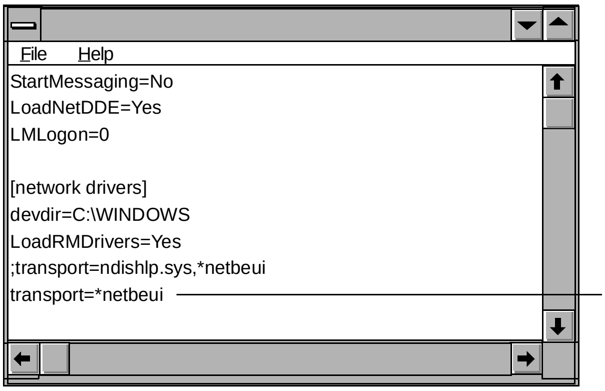
The installation program adds a PATH statement with the path to the GCOM directory.

This statement invokes the Windows 3.1 network functionality

Figure 3-5. An Windows 3.1 version of the AUTOEXEC.BAT file

The SYSTEM.INI file

The following changes are made to the SYSTEM.INI file residing in the Windows directory, see Figure 3-6



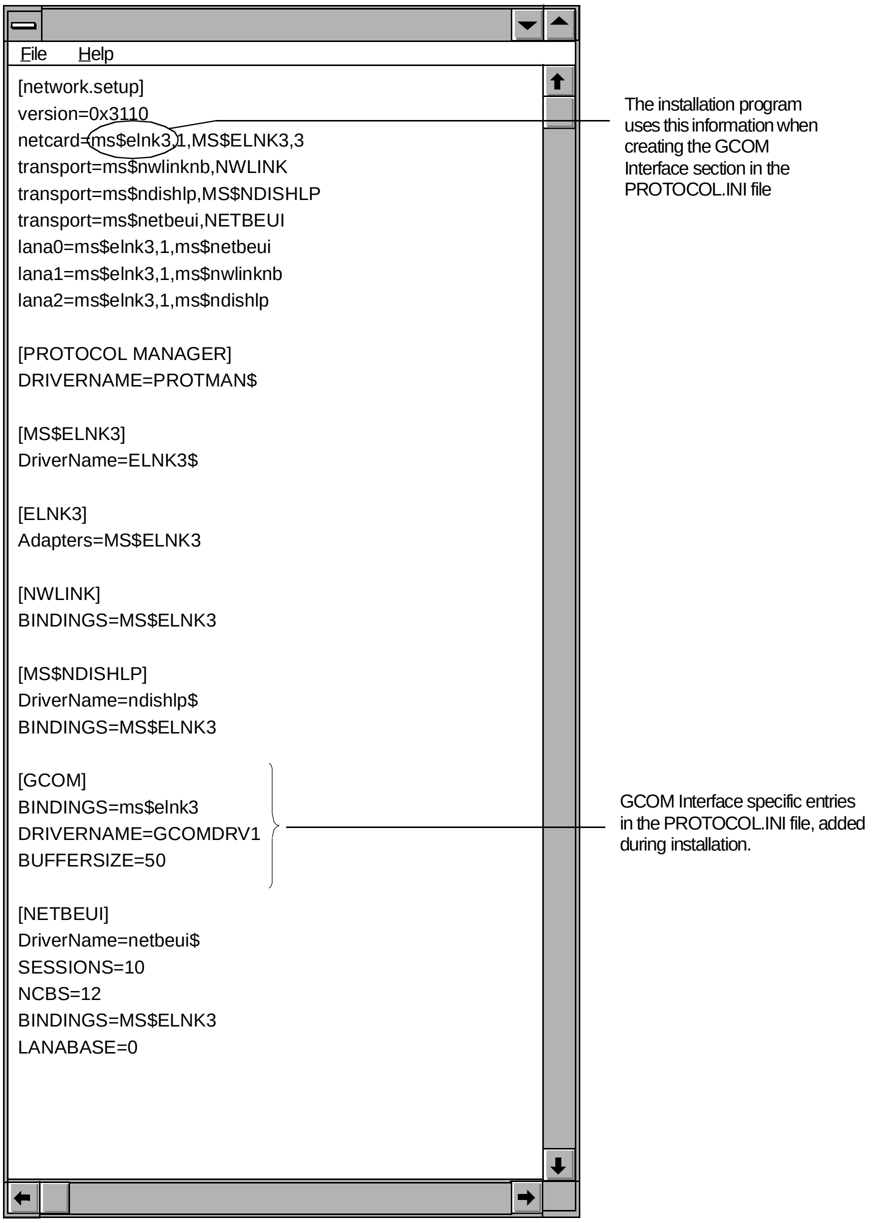
```
StartMessaging=No
LoadNetDDE=Yes
LMLogon=0

[network drivers]
devdir=C:\WINDOWS
LoadRMDrivers=Yes
;transport=ndishlp.sys,*netbeui
transport=*netbeui
```

The NDISHLP transport protocol is transferred to the CONFIG.SYS file to be loaded during the MS DOS start up.

Figure 3-6. Example of a SYSTEM.INI *file configured for use of GCOM Interface*

The PROTOCOL.INI File

The following changes are made to the PROTOCOL.INI file residing in the Windows directory, see Figure 3-7



```
[network.setup]
version=0x3110
netcard=ms$elnk3,1,MS$ELNK3,3
transport=ms$nwlinknb,NWLINK
transport=ms$ndishlp,MS$NDISHLP
transport=ms$netbeui,NETBEUI
lana0=ms$elnk3,1,ms$netbeui
lana1=ms$elnk3,1,ms$nwlinknb
lana2=ms$elnk3,1,ms$ndishlp

[PROTOCOL MANAGER]
DRIVERNAME=PROTMAN$

[MS$ELNK3]
DriverName=ELNK3$

[ELNK3]
Adapters=MS$ELNK3

[NWLINK]
BINDINGS=MS$ELNK3

[MS$NDISHLP]
DriverName=ndishlp$
BINDINGS=MS$ELNK3

[GCOM]
BINDINGS=ms$elnk3
DRIVERNAME=GCOMDRV1
BUFFERSIZE=50

[NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=12
BINDINGS=MS$ELNK3
LANABASE=0
```

The installation program uses this information when creating the GCOM Interface section in the PROTOCOL.INI file

GCOM Interface specific entries in the PROTOCOL.INI file, added during installation.

Figure 3-7. The PROTOCOL.INI file configuration when using the GCOM Interface.

3.2 Capacity and Performance

The GCOM Interface performance is depending on client application program and on the current work load in the Advant Controllers. Refer to the *AdvaSoft for Windows User's Guide* and the *AdvaCommand Development, AdvaCommand Runtime User's Guide* for more information about capacity together with client application.

Table 3-1. Capacity of the GCOM Interface

Description	Data
Throughput	150 objects/sec (Cyclic subscription)
Subscription times	1,3 and 9 sec. Cycletimes longer than 30 sec are made through cyclic demand subscriptions

3.3 Application Start-up

The GCOM Interface is automatically started when AdvaSoft for Windows is started, provided the GCOM protocol is specified in the ADVASOFT.INI file.

```
[Communication]
Protocols=GCOM
```

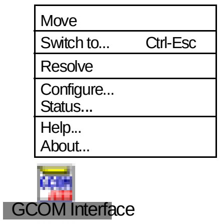
If the connection to a node on the GCOM or MB 300 networks fails during execution, the program will still be running, but a communication error will be passed to the client applications. When connection is re-established all active subscriptions are automatically started.

3.4 Tutorial

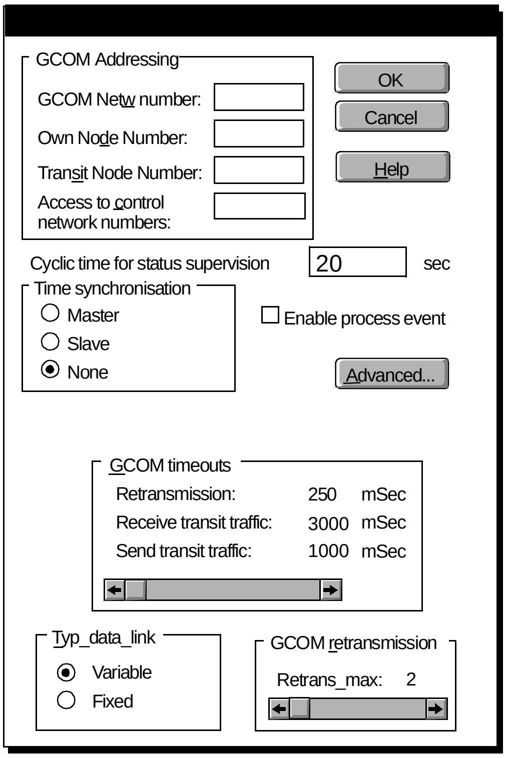
No special tutorial is supplied within this guide. The GCOM Interface functionality involves functionality mainly intended for configuration and run-time network monitoring, and is explained in other parts of this guide.

3.5 Application Procedures

3.5.1 GCOM Configuration Functionality



All configuration of the GCOM Interface is done using the configuration dialog box. You open the dialog box by selecting **Configure...** from the **System** menu. The configuration dialog box is also available from the **Option** menu in the AdvaSoft's main window.



GCOM Addressing
GCOM Netw number:
Own Node Number:
Transit Node Number:
Access to control network numbers:

Cyclic time for status supervision 20 sec

Time synchronisation
○ Master
○ Slave
● None

☐ Enable process event

GCOM timeouts
Retransmission: 250 mSec
Receive transit traffic: 3000 mSec
Send transit traffic: 1000 mSec

Typ_data_link
● Variable
○ Fixed

GCOM retransmission
Retrans_max: 2

Figure 3-8. GCOM Interface configuration dialog, the extended version is shown when the Advanced... button is pressed

Settings done in the GCOM Settings dialog box is written to the ADVASOFT.INI file in the [GCOMProfile] section, see Appendix A, Settings in the ADVASOFT.INI file.

3.5.2 Basic Configuration

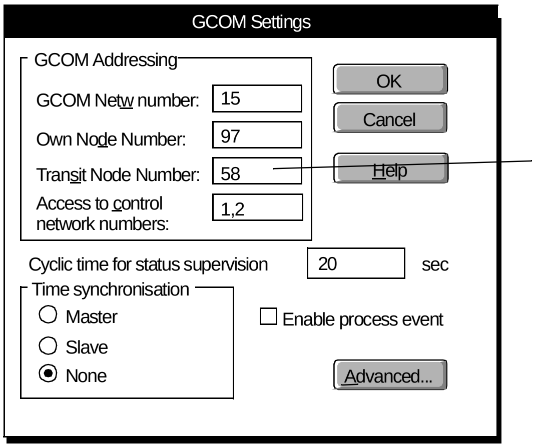
Setting up the Node Addresses

In the **GCOM Setting** dialog box, several address parameters have to be set according to the actual network layout.

Some of the settings concern the addresses used in the GCOM network. You find these in the subgroup **GCOM Addressing** in the **GCOM Settings** dialog. Also study Figure 3-1 for information about the used network and node settings.

- The **GCOM Netw number** and **Own Node number** are used to set network and node for the current Advasoft for Windows station.
- The **Transit Node number** defines which nodes in the GCOM network are transit nodes. The transit node parameter is limited to 1…99, 127. Only a MasterGate 230/1 can act as a transit node. The **Access to control network numbers** decides which control networks you have access to. A control network number is specified as the tenth of the network address. For example, if your network number is 15, the control network number is 1, for network number 24, the control network number is 2 and so on.

If the settings in Figure 3-1 are used, a filled in GCOM configuration dialog can look like Figure 3-9.



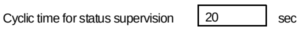
GCOM Netw number: 15
Own Node Number: 97
Transit Node Number: 58
Access to control network numbers: 1,2
Cyclic time for status supervision 20 sec
○ Master
○ Slave
● None
☐ Enable process event

If communication with more then one transit node (the most usual configuration) is desired, specify the numbers of these nodes, separated by commas

Figure 3-9. Example of a filled in configuration dialog

Specifying Cyclic Communication Status Update Times

GCOM Interface has a function dedicated for supervising the communication status for all nodes in the system. A communication status request is sent to each transit node, with a cyclicity defined in the Cyclic time for status supervision box.



Cyclic time for status supervision 20 sec

When a node connection is lost, GCOM Interface scans all active subscriptions for the corresponding node. If the node is found, the subscription is temporary disabled. When the connection is re-established, GCOM Interface, as a first action, issues a global cancel of the subscription to the controller. Next action is to make a new subscription for the corresponding objects.

The default Cyclic time for status supervision is 20 seconds.

Process Events Handling

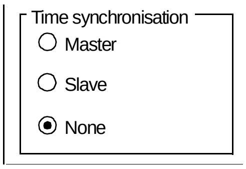
☐ Enable process event

This function allows client applications to subscribe to Time tagged process events. Since this function is applicable only to AI, AO, DI and DO objects, all process events that do not belong to these types of objects are filtered.

You enable the function by checking the **Enable process event** box in the GCOM Settings dialog box. This affects available nodes and configures the AdvaSoft station as a node subscribing for process events from the controller.

Process event handling is disabled by default.

Time Synchronization



Time synchronisation
○ Master
○ Slave
● None

You can configure an AdvaSoft station as Master, Backup, Slave or None according to the type of time synchronization used.

- **Master**
  A time synchronization message is sent by the AdvaSoft station every 10 minutes. If a time synchronization signal is **received** in this mode, an error message is sent to the error log.
- **Slave**
  In this mode, the AdvaSoft station synchronizes its local time with the synchronization message sent over the GCOM link.
- **None**
  No time synchronization.

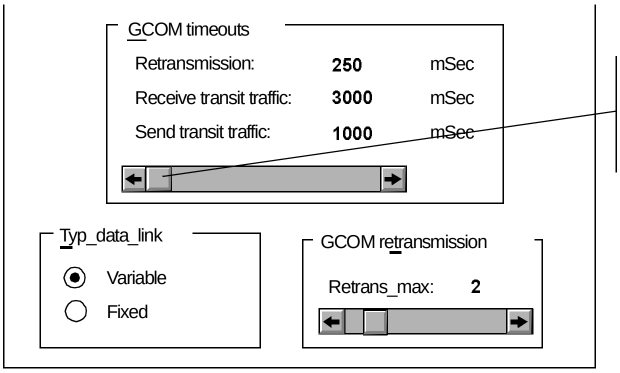
Time synchronization is by default set to **None**.

For general configuration guidelines for the time synchronization in the Advant OCS system, refer to MasterNet User’s Guide.

3.5.3 Advanced Communication Settings

If the button **Advanced...** is pressed, the dialog box increases in size and adds the following dialog sub-groups:

- GCOM timeouts
- Typ_data_link
- GCOM retransmission.



GCOM timeouts

Retransmission: 250 mSec

Receive transit traffic: 3000 mSec

Send transit traffic: 1000 mSec

Typ_data_link

● Variable

○ Fixed

GCOM retransmission

Retrans_max: 2

All timeout settings is linked to each other. By moving the scrollbar button all settings change according to their internal relationships.

Figure 3-10. Additional communication settings shown when the Advanced... button is pressed

GCOM Timeouts

- **Retransmission time-out** is the maximum time in which the packet must be acknowledged before it is retransmitted.
- **Receive transit traffic time-out** is the maximum time between "I am here" messages from nodes on the GCOM network.
- **The send transit traffic time-out** decides time interval between "I am here" send messages.

The settings shown i Figure 3-10 is to be used when using bridges for long distance that slows down communication performance. Because of this, the time-out settings can be increased to adapt to the GCOM Extended protocol.

Data Link

- "**Type_data_link**" (MAC frame size) is fixed or variable packet size. The fixed size is 512 byte and the variable is 64 - 1514. Fixed size is recommended only when a controller that is not using variable packet size is present in the system. Default is **Variable**.

Retransmissions

- The "**GCOM retransmissions**" is the maximum number of retransmissions allowed before the message is dropped. Dropped messages are reported to the System Messages.

3.5.4 Cyclic Communication Status Supervision

This function supervises the communication status for all relevant nodes in the system.
A communication status request is sent to each transit node, with a time period defined by the ‘ComsupCycleTim=xx’ in the ADVASOFT.INI [GCOM Profile] section. Default cycle time is 20 seconds. For each time period, a communication status request is sent to all transit nodes in the ADVASOFT.INI file (if the system is on plant network, a subscription is made for communication status from all MG 230/1 nodes).

The received response is compared with the old network status. The subscription status for all lost connections is updated, all old subscriptions for reconnected nodes are cleared, all pending client subscriptions are checked and new corresponding subscription requests are made.

3.5.5 Handling of TTD logs

The access to the TTD logs is provided by the Log Manager object. The Log Manager object exist in one instantiate in each AdvaSoft node. It provides on demand access to TTD logs in the controller. No configuration of the TTD log is provided, only access to existing TTD logs. The Log Manager object is supported through the AdvaInform User API function xxxGetAttribOnEventWithInit. The following operations are supported:

- OMF_LogMgrGetNumericID

  For deriving the log data, the following argument information must be known

  - Start time
  - Number of values

  The access can be done using two types of addressing:

  - TTD Log name
  - Process object name and attribute

- OMF_LogMgrGetLogAttributesID

  The following attributes can be requested:

  - OMF_LogMgrNAMEID
    The answer on this request is the object name, NOT the log name.
  - OMF_LogMgrDESCRIPTIONID
    The answer on this request is the object description, NOT the log description.
  - OMF_LogMgrLOG_ENG_UNITID
    The answer on this request is the object unit.
  - OMF_LogMgrPRES_RANGE_MINID
    The answer on this request is the presentation range min.
  - OMF_LogMgrPRES_RANGE_MAXID
    The answer on this request is the presentation range max.
  - OMF_LogMgrSTORAGE_INTERVALID
    The answer on this request is the log interval in seconds.

Inputs are log name or process object name and process object attribute.

TTD Log Name

The Log name containing network number, node number and log identity, for example "TTD_10_71_1_1". When the log name is used then the output will be data, time and status for the requested TTD log.

Process Object Name and Attribute:

Object name and logged attribute for example "AIC73_1,MV". When the Process Object name/attribute are used then the output will be the specified information.

3.5.6 Process Event Handling

This function allows client applications to subscribe to Time tagged process events. The function uses the EADISTR object. The functions is by default disabled in the GCOM Interface. To enable the function, the GCOM Settings dialog can be used, by adding the ‘EnableProcEv=On’ statement in the [GCOMProfile] section, residing in the ADVASOFT.INI file.

Since only the AI, AO, DI and DO objects are implemented in the GCOM Interface, all process events NOT belonging to this objects, will be filtered. This filtering can however be disabled, using the ‘NoEvFilter=On’ in the ADVASOFT.INI [GCOMProfile] section. No dialog exist for this function.

If the ‘EnableProcEv is ON, a meesage is sent to each of the found nodes in the own control/plant network. This message specifies the AdvaSoft station as a node subscribing for process events from the controller.

The process events to be passed to the client application. The data consists of object name, description, unit, reason of event, attribute of the event, time of the event.

3.6 Configuration/Application Building Menus

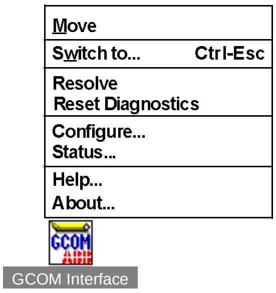
No configuration, other than the ones described in earlier sections, is needed for GCOM Interface. No application building menus is present in the GCOM Interface software since the intention with the software is pure communication functionality.

Chapter 4 Runtime Operation

4.1 Product Operation

This section gives a brief description on how the GCOM Interface operates during start-up, runtime, and shutdown.

Before normal operation, complete the configuration, described in chapter 3.



Start-up

The GCOM Interface is started when you start AdvaSoft for Windows, if GCOM is the specified protocol in the ADVASOFT.INI file. During start up, a status check is performed to check for all reachable nodes. The status check comprises nodes directly connected to the GCOM network, and nodes indirectly connected through a GCOM transit node.

Runtime

During runtime, GCOM Interface supervises network status for all relevant nodes in the system, application request for data subscription, subscriptions for time tagged process events and time synchronization. This is done periodically with a cycle time specified in the GCOM Settings dialog box.

Due to the fact that the GCOM nodes, for example the MG230/1, MP200/1, and AC450, have a internal object configuration, no object configuration is needed in the GCOM Interface.

Shut Down

AdvaSoft for Windows performs, when halted, an automatic shut-down of the GCOM Interface. If you try to perform a AdvaSoft for Windows shut-down, when using the GCOM Interface, and a client application is still active, AdvaSoft for Windows will present a message where you have to confirm the action.

4.2 Operating Overview

During ordinary runtime conditions, GCOM Interface communication software provides you with the following:

- functions for runtime configuration of the GCOM Interface communication software.
- functions for monitoring current GCOM network status.
- functions for resolving symbolic objects names for objects connected to the GCOM network.

4.3 Runtime Tutorial

No tutorial for GCOM Interface runtime operation is supplied within this guide. We recommend you to study the User's Guide for AdvaSoft for Windows and the included DDE Server examples, to see how the GCOM Interface is used under working conditions.

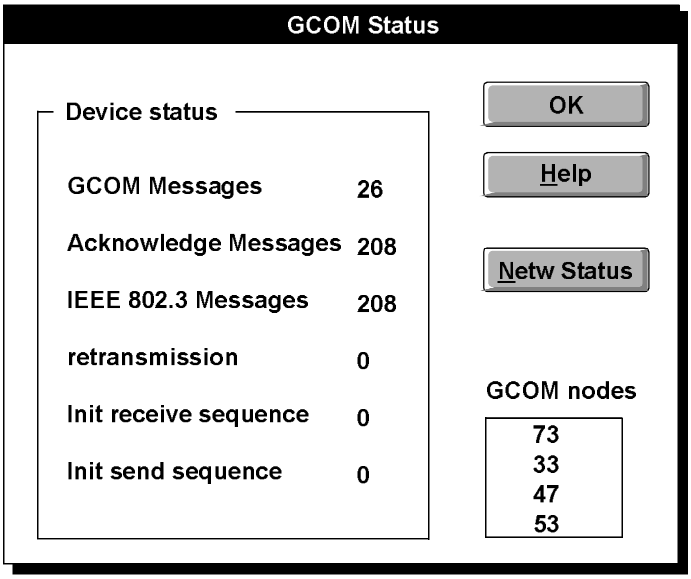
4.4 Operating Instructions

Normally, the GCOM Interface software is started when you start AdvaSoft for Windows. You can also start it by double clicking the GCOM icon in the AdvaSoft program group in the Program Manager.

The GCOM Interface is halted when the AdvaSoft for Windows program is closed.

4.4.1 Viewing Communication Status

When choosing the **Status...** item in the **System** menu, the following dialog box is presented:



Device status

GCOM Messages 26

Acknowledge Messages 208

IEEE 802.3 Messages 208

retransmission 0

Init receive sequence 0

Init send sequence 0

GCOM nodes

73
33
47
53

*Figure 4-1. The **GCOM Status** dialog*

The following information is provided in the dialog:

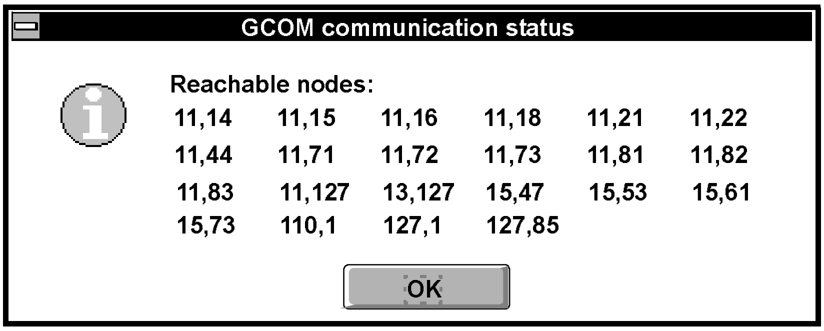
- **GCOM Messages**
  This is the number of data packets (DSX signals) passed to and from the GCOM protocol module. Only the messages into GCOM Interface are counted.
- **Acknowledge Messages**
  The number of transmitted and received acknowledge packets.

- **Init receive sequence**
  The number of transmitted and received 'init receive sequence counter' packets.
- **Init send sequence**
  The number of transmitted and received 'init receive sequence counter' packets.
- **IEEE 802.3 Messages**
  The number of packets passed to and from the MAC-handler.
- **Retransmissions**
  The number of retransmissions on the outgoing packets (DSX signals).
- **GCOM nodes**
  Available nodes directly connected to the GCOM network.

This dialog is not automatically updated. You have to re-open the dialog box to make an update.

4.4.1.1 Network Status

By pressing the **Netw Status** button, an information box, showing available GCOM nodes, is presented, see Figure 4-2.

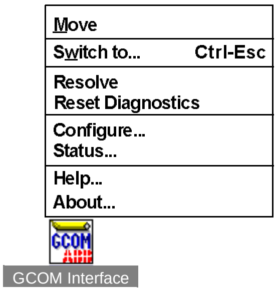


```
Reachable nodes:
11,14    11,15    11,16    11,18    11,21    11,22
11,44    11,71    11,72    11,73    11,81    11,82
11,83    11,127   13,127   15,47    15,53    15,61
15,73    110,1    127,1    127,85
```

Figure 4-2. Network status information box.

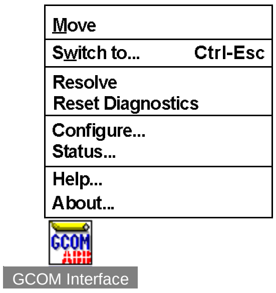
Each reachable node is presented with network and node number.

4.4.1.2 Resetting the Diagnostic Information



By selecting the **Reset Diagnostics** item in the GCOM Interface configuration menu, the diagnostic information found in the **Device Status** field in the **GCOM Status** dialog is reset and re-started.

4.4.2 Resolve Operation



An object is resolved when it is available in the memory, or in the local symbol file, with object location and object type. When a node is added or removed, or when the local symbol file no longer correlates with the actual situation, a resolve operation should be done.

Select the **Resolve** item in the **System** menu to resolve all objects connected to the GCOM network. A name translation message is sent to each connected node on the network.

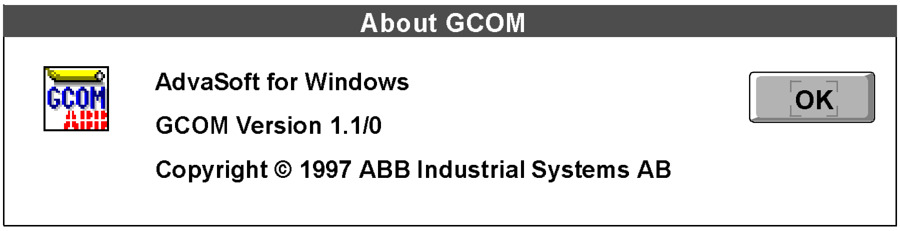
When the response signal is received with the object information (network, node, logical file, record and object type), it is stored and written to the local symbol file GCOMSYMB.DTA. See also *Section 1.8.1.1, Symbolic Name Translation Operation* for more information about the resolve operation.

NOTE

The resolve operation will take time, especially in a large system with many objects. The client application will only be stopped during the time the network broadcasts messages are sent.

4.4.3 Attaining the GCOM Interface Version

By selecting the **About...** item in the System menu you can view the current version of the GCOM Interface, see Figure 4-3.


About GCOM

AdvaSoft for Windows

GCOM Version 1.1/0

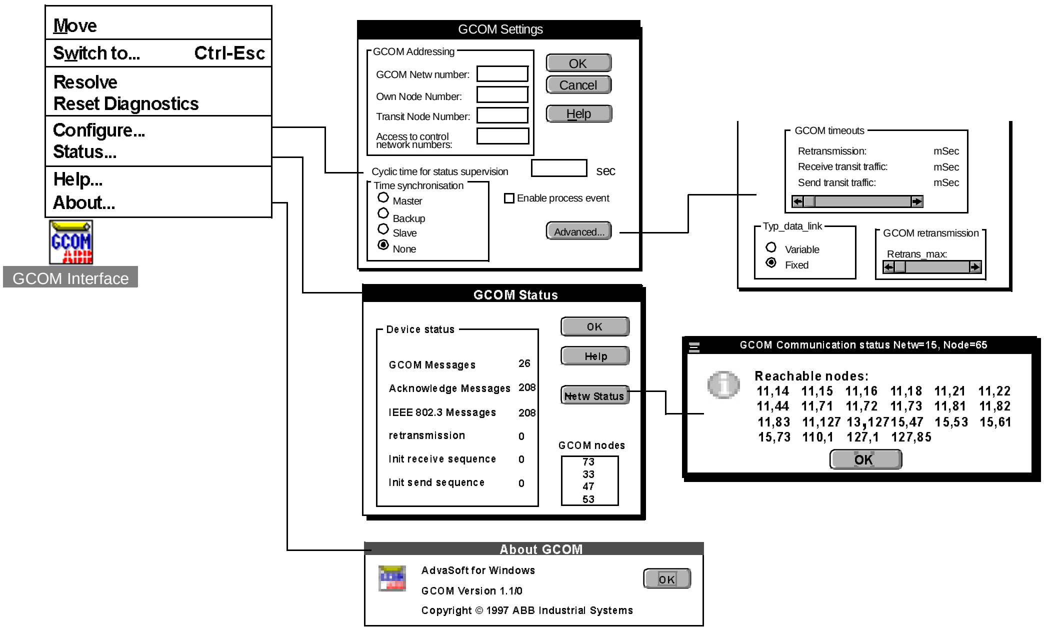
Copyright © 1997 ABB Industrial Systems AB

Figure 4-3. The About Box

Close the About box by clicking **OK**.

4.5 Runtime Operation Menus

Use the following menus during normal runtime operation of the GCOM Interface , see Figure 4-4.



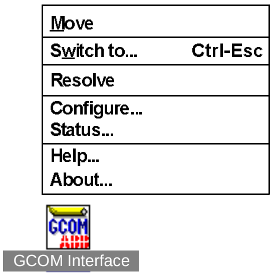
Device status	
GCOM Messages	26
Acknowledge Messages	208
IEEE 802.3 Messages	208
retransmission	0
Init receive sequence	0
Init send sequence	0

GCOM nodes: 73, 33, 47, 53

Reachable nodes:
11,14 11,15 11,16 11,18 11,21 11,22
11,44 11,71 11,72 11,73 11,81 11,82
11,83 11,127 13,12715,47 15,53 15,61
15,73 110,1 127,1 127,85

AdvaSoft for Windows
GCOM Version 1.1/0
Copyright © 1997 ABB Industrial Systems

Figure 4-4. The menus and dialogs used when working with the GCOM Interface



The System menu items **not** described in the figure are:

Move

A standard Window function for relocating the application window on the screen.

Switch to...

A standard Window function for switching between MS-Windows applications.

Resolve

By choosing this menu item, you manually initiates a resolve operation.

Help...

By choosing this menu item, the GCOM Interface related help will be displayed

About...

Present the About... message box where the application name, version and date are shown. This information is useful when contacting ABB support.

Chapter 5 Maintenance

5.1 Preventive Maintenance

As an addition or during the normal system backups, we recommend you to take regularly backups of files essential for the GCOM Interface functionality. We also recommend you to take a backup when you reconfigure your network.

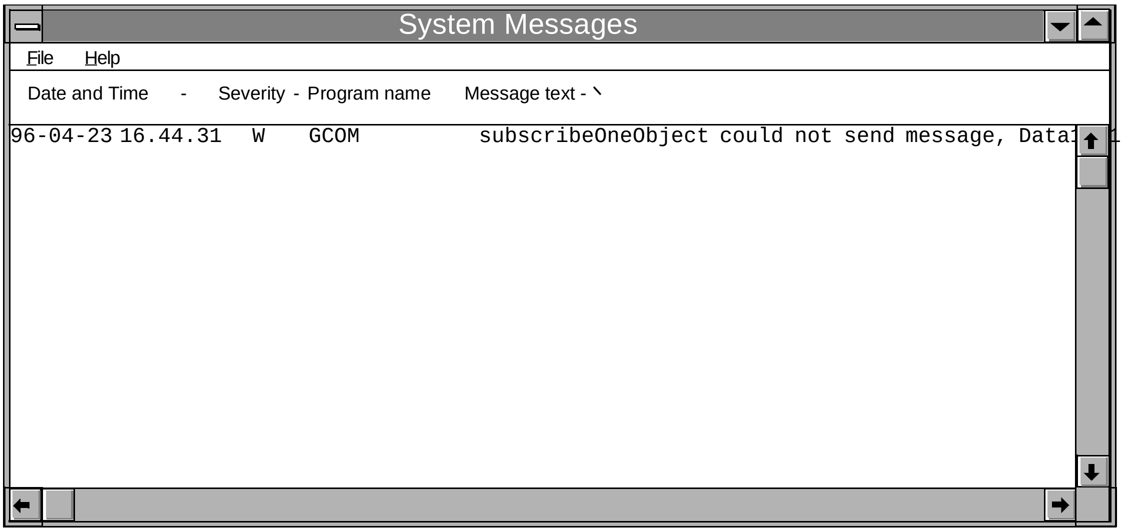
- C:\ADVASOFT\GCOM\DATA\GCOMSYMB.DTA
  GCOM stores the object configuration information in this file.
- C:\WINDOWS\ADVASOFT.INI
  This file contains entries specific for the GCOM Interface.
- C:\CONFIG.SYS
  This file should be included in the backup because of the editing during the GCOM Interface installation.
- C:\AUTOEXEC.BAT
  This file should be included in the backup because of the editing during the GCOM Interface installation.
- C:\WINDOWS\PROTOCOL.INI
  This file should be included in the backup because of the editing during the GCOM Interface installation.

5.2 Hardware Indicators

No special, GCOM specific, hardware is included in the GCOM Interface option.

5.3 System Messages

All GCOM Interface related software errors are reported in the common Advasoft for Windows System Messages application log. The appearance of the log is shown in figure Figure 5-1.



```
96-04-23 16.44.31   W    GCOM          subscribeOneObject could not send message, Data
```

Figure 5-1. The System Messages application, common for all AdvaSoft for Windows modules.

Click on the System Messages icon for the produced error messages.

5.3.1 Error Messages related to GCOM Interface

The error information reported to the System Messages application helps you to determine the error source. The error messages listed below appear in the System Messages window. Perform the suggested actions only if you are qualified to do so.

If you send a problem report to the local ABB service organization, it is essential that you know the sequence of events before the error occurred and any error status and/or message present.

The following error messages are GCOM Interface specific:

xxxx could not send message, Data1=xxx

Indicates a problem when sending messages. The message is shown when you try to remove or add a data subscription, or try to send commands when the communication with the node is lost due to network load or other factors that influence the network performance.

The first xxxx section is replaced with the name on the actual place in GCOM Interface where the problem occurred. The following GCOM routines can send this message:

- AIHandler
- cancel StrayObject
- ProEvHandler
- SubscrOneObject
- SymbHandler
- wiuResolve

The status code, **Data1=**, can have the value -1, 400-420. The following messages apply to the different status values:

-1	Node is down

Action: Check with the System Manager about the status of the system and if any node is down. You can also check the system by selecting the **System Status** item in the GCOM **Configuration** menu

401	Illegal command
411	Invalid subfunc code (MS-DOS)
412	Invalid_GCOM_service_call
413	PCB_unknown
414	PCB_not_accepted
415	program_already_running
416	receive_timeout
417	unknown_node_number
418	send_buffer_full
419	retrans_timeout
420	
421	invalid handle or not open (MS-DOS)
422	
423	

Actions: The status message indicates the problem source and actions to take if the common “wait for a while before repeating the last action” does not apply.

AIHandler: illegal command received

A very rare message that should normally never be displayed. It indicates a faulty command.

Action: Check the last command.

Data could not be written to the file, return value

A GCOMSYMB.DTA file related problem. When trying to write information to the file, the following problems can arise:

- The file could not be opened because another application has allocated the file, a text editor for example.
- No more space available on your local hard disk. No more information can be written on the disk.

Actions:

- Close the application that allocates the GCOMSYMB.DTA file.
- Free more disk space by removing temporary files, old and no longer used programs.

DTA file corrupted. Check that the file is empty

This is also a GCOMSYMB.DTA file related problem. GCOM Interface could not write to the symbol file because the GCOMBSYMB.DTA file is corrupt.

Action: GCOM Interface will automatically delete the GCOMSYMB.DTA file, residing in the ADVASOFT directory, and replace it with an empty GCOMSYMB.DTA. If you want to keep the configuration information you can replace this empty file with the backup version.

NOTE

When removing the GCOMSYMB.DTA file, all GCOM Interface configuration data will be lost. You have to redo the configuration if you do not use an up to date backup version to replace the corrupt file.

New node is up

Sent when a node, that was down, goes to operational mode or when a node is added to the system.

Action: —

No more Timer Entries available

A memory allocation related problem. All timer entries are queued. When the queue is full, this message is shown. The problem can occur when GCOM Interface has been running for a long time and old timer entries object remains and blocks the timer entries queue.

NOTE

Only related to demand subscriptions with subscription times longer than 30 sec.

Action: Close GCOM Interface and make a restart. This should remove the old object timer entries.

Node is down

Displayed when GCOM Interface detects that communication with a node is lost.

Action: Check the system status. If no software errors can be detected, you have to check the hardware, communication boards, and network.

Out of entries in symbol array

Occurs when a resolve operation handles many objects.

Action: Wait for a while until GCOM Interface has ended the broadcast sendings.

Out of ObjectEntries, firstfree, iLastUsedObjEnt

Shown previous to the "No more Timer Entries available" message. Refer to the "No more Timer Entries available" explanation.

Action: —

RegEnt = Null

When the client application tries to collect a non existing registration entry, a error message is sent to the System Messages application.

Action: Check the function of the client application.

Signal could not be sent to this node

Displayed when you are trying to update subscription to a node — that has been down and then has gone operational again — and the node does not answer back.

Action: Check the node and try again.

SYS_TEXT DATA1=TEXT_INDEX

Occurs when you try to change the value or status for an object and no select operation has been done or when the object is allocated.

Action: GCOM Interface returns a number that refers to table 3-13 in the GCOM Multidrop User's Guide. Study the table and then perform suitable actions.

Timer Entry not found

Shown when an existing Timer Entry has no connection to an object.

Action: —

5.3.2 Error Messages during MS-DOS Start-up

The Following error messages are related to communication protocols and software problems

Protocol Manager has detected an Incomplete Binding

Occurs when there is a conflict between two network protocols. During the loading of the GCOM driver, you can see, maybe by using the possibility to press **F8** and then step by step go through the statements in the CONFIG.SYS file, a message that normally looks like this:

```
MAC Layer   ms$elnk3
LLC         42 kbyte
```

will look like:

```
MAC Layer
LLC         42 kbyte
```

or:

```
MAC Layer   [$]\/
LLC         42 kbyte
```

The two later messages indicate a problem when loading the GCOM Driver.

Actions: Watch for possible network protocols compatibility problems. Study your network software documentation. Disable all unnecessary network protocols. Experience collected during installation was that when disabling a Packet Driver, actually not in use, the GCOM driver was able to load.

No Protocol Manager could be found

The PROTMAN.DOS statement in the CONFIG.SYS file is missing or placed after a request for loading a network driver, for example, the GCOM driver.

Actions: Edit the CONFIG:SYS file and check that the PROTMAN.DOS statement precedes all request for loading network drivers. See also Section 3.1.3, System Files Configuration.

5.4 Fault-Finding and User Repair

If your system is not running properly, follow the list below to determine cause and actions.

1. Choose the **Status...** item from the GCOM **Control** menu and verify that no errors are detected
2. View the messages sent to the **System Messages** application to determine the source of the problem.
3. If the GCOM Interface software is the source, go on to the next point. If the problem originates from a software unit in your system, consult the corresponding user's guide.
4. Check the critical status flags and error messages. Execute the actions recommended in Section 5.3.1, Error Messages related to GCOM Interface.
5. If the actions above are unsuccesfull, contact your local ABB Industrial System support representative as instructed in the AdvaSoft for Windows User's guide.

As a last resort, try to restart Windows if the GCOM Interface software does not respond.

5.4.1 Help Menus for the GCOM Interface

To get help, press <F1>, which gives you help on the current topic, where applicable. To find help on specific topics, select the **Help** menu, then the menu items **Search**, **Show Topics** or **Index**.

5.4.2 System Status

The system status shows the status of communication options running. If an error has occurred, a message is shown, stating the error type.

5.4.3 System Messages

The System Messages application identifies errors from the installed AdvaSoft for Windows software and hardware, shows their severity, their source and the time they occurred. For more detailed information and recommended action for each error, refer to Chapter 5 in each AdvaSoft for Windows User's Guide.

5.5 Troubleshooting

If you have questions about, or problems with, your AdvaSoft for Windows product, check the user's guide for the respective unit or go to the **Help** menu.

5.6 How to get support from ABB

If your question is not answered, contact your local ABB representative responsible for this product. If you have questions on any third-party products, contact the product support services responsible for these.

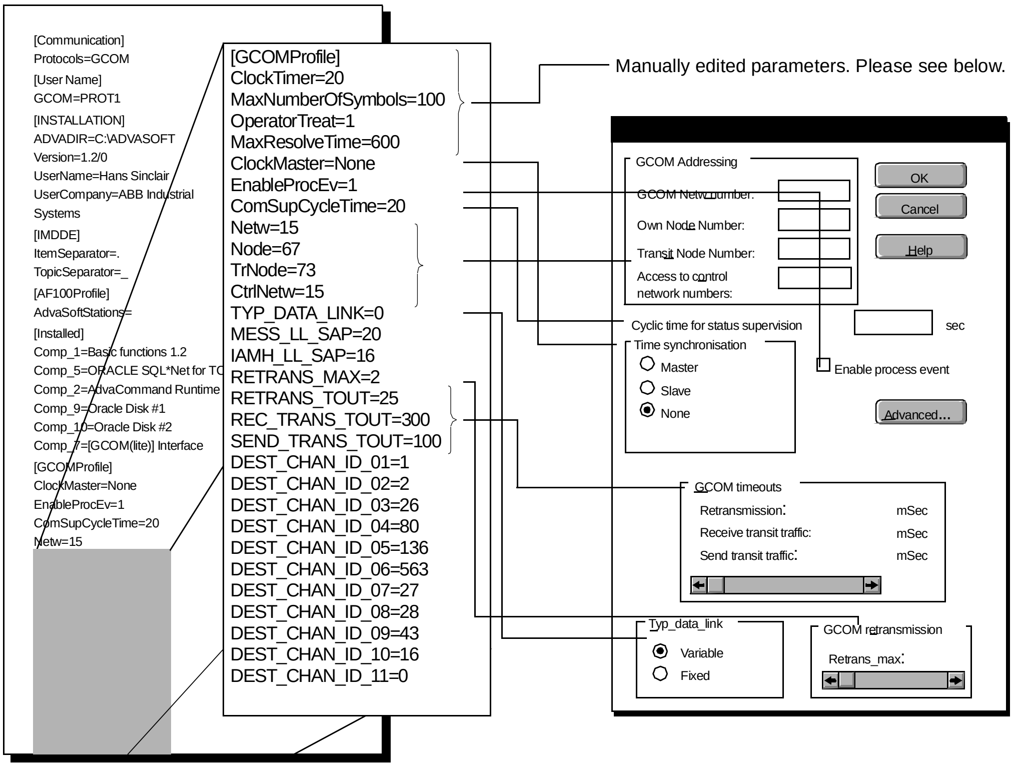
If you encounter errors or if you have suggestions to improve the AdvaSoft for Windows product, please contact your local ABB Industrial Systems AB representative.

When you submit a problem report, it is important that you reconstruct the events leading to the problem so we can quickly resolve it. Therefore, attach any relevant supplementary information, for example, changes to your system or events prior to the problem. Printouts of the System Messages logs and hard copies of configuration displays are often very important.

Appendix A Settings in the ADVASOFT.INI file

A.1 General Information

The ADVASOFT.INI file, residing in the MS-Windows directory, contains a **[communication]** and a **[GCOMprofile]** section where a number of configuration parameters are defined.



```
[Communication]
Protocols=GCOM
[User Name]
GCOM=PROT1
[INSTALLATION]
ADVADIR=C:\ADVASOFT
Version=1.2/0
UserName=Hans Sinclair
UserCompany=ABB Industrial
Systems
[IMDDE]
ItemSeparator=.
TopicSeparator=_
[AF100Profile]
AdvaSoftStations=
[Installed]
Comp_1=Basic functions 1.2
Comp_5=ORACLE SQL*Net for TC
Comp_2=AdvaCommand Runtime
Comp_9=Oracle Disk #1
Comp_10=Oracle Disk #2
Comp_7=[GCOM(lite)] Interface
[GCOMProfile]
ClockMaster=None
EnableProcEv=1
ComSupCycleTime=20
Netw=15
```

```
[GCOMProfile]
ClockTimer=20
MaxNumberOfSymbols=100
OperatorTreat=1
MaxResolveTime=600
ClockMaster=None
EnableProcEv=1
ComSupCycleTime=20
Netw=15
Node=67
TrNode=73
CtrlNetw=15
TYP_DATA_LINK=0
MESS_LL_SAP=20
IAMH_LL_SAP=16
RETRANS_MAX=2
RETRANS_TOUT=25
REC_TRANS_TOUT=300
SEND_TRANS_TOUT=100
DEST_CHAN_ID_01=1
DEST_CHAN_ID_02=2
DEST_CHAN_ID_03=26
DEST_CHAN_ID_04=80
DEST_CHAN_ID_05=136
DEST_CHAN_ID_06=563
DEST_CHAN_ID_07=27
DEST_CHAN_ID_08=28
DEST_CHAN_ID_09=43
DEST_CHAN_ID_10=16
DEST_CHAN_ID_11=0
```

Manually edited parameters. Please see below.

Time synchronisation: ○ Master ○ Slave ● None

☐ Enable process event

Typ_data_link: ● Variable ○ Fixed

Figure A-1. GCOM related sections in the ADVASOFT.INI file

GCOM has to be defined in the **[COMMUNICATION]** section as one of the installed protocols in the **Protocols** parameter.

Most of the GCOM Interface specific parameters in the ADVASOFT.INI file can be modified by using the **GCOM Settings** dialog box. This box found in the GCOM Interface **System** menu or in the Advasoft for Windows **Option** menu, see Figure A-1. The ClockTimer, MaxNumberOfSymbols, OperatorTreat, MaxResolveTime parameters that has to be manually edited in the ADVASOFT.INI file.

The **DEST_CHAN_ID** statement defines the global channel indexes for received signals, to be passed to the GCOM Interface by the Device driver. These channel numbers should normally not be changed. If the **ClockMaster** statement is set to zero (Clockmaster=0) the corresponding global channel index, DEST_CHAN_ID_xx, is removed.

Manually Edited Parameters

The following parameters have to be manually edited in the ADVASOFT.INI file.

ClockTimer
Time used for subscription supervision. Also used for cycle time resolution for subscriptions, with a subscription cycle longer than 30 sec.

Default: 30 sec.

MaxNumberOfSymbols
Maximum number of unresolved symbols that can be treated simultaneously.

Default: 150

OperatorTreat
If this parameter is set to 1 (On), all operator commands will be logged in the Alarm History.

Default: 0 (Off)

MaxResolveTime
Maximal time that the GCOM Interface will try to resolve a symbol.

Default: 300 sec

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